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# VALIDATION REPORT

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## LIAONING BEIPIAO BEITAZI I WIND FARM PROJECT

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REPORT NO. 01 997 9105045057

REVISION NO. 04.2

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CDM Validation Report Template  
Version 5.0, November 2006

# VALIDATION REPORT

Date of first issue: July 9, 2009	Project No.: 01 997 9105045057	<b>TÜV Rheinland Japan Ltd.</b>  <i>Shin Yokohama Daini Center Bldg., 3-19-5, Shin Yokohama Kohoku-ku, Yokohama 222-0033</i>
Approved by: Dr. Manfred Brinkmann	Organisational unit: Energy & Environment, Industrial Service	
Client: China Power Complete Equipment Co., Ltd.	Client ref.: Mr. Li Qizhao	Certificate Number 01 997 9105045057

**Project Name:** Liaoning Beipiao Beitazi | Wind Farm Project

**Country:** P.R.China

**Methodology:** ACM0002

**Version:** 07

**GHG reducing Measure/Technology:** Wind power

**ER estimate:** 126,010 tCO<sub>2</sub>e/year

## Size

- ☒ Large Scale  
☐ Small Scale

## Validation Phases:

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

## Validation Status

- ☒ Corrective Actions Requested  
☒ Clarifications Requested  
☒ Full Approval and submission for registration  
☐ Rejected

In summary, it is validation team's opinion that the [Liaoning Beipiao Beitazi | Wind Farm Project](#), in P.R.China, as described in the PDD Version 02.7 of [27<sup>th</sup> November](#) 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 Version 07. The validation team of TÜV Rheinland Japan Ltd. thus recommends the proposed project to be registered as a CDM project activity with the UNFCCC.

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Beitazi | Wind Farm Project

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Report No.: 01 997 9105045057	Date of this revision: <a href="#">2009-12-04</a>	Rev. No. <a href="#">04.2</a>
Report title: <a href="#">Liaoning Beipiao Beitazi   Wind Farm Project</a>		
Work carried out by: - Team Leader: Mr. Ning Zhang - Trainee: Mr. Libo Ma		
Work verified by: - Dr. Manfred Brinkmann		

Climate Change

Kyoto Protocol

Large-scale Project Validation

Clean Development Mechanism

Wind Power Project

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## Abbreviations

ACM	Approved Consolidated Methodology
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide Equivalent
CPCEC	China Power Complete Equipment Co., Ltd.
CPI	China Power Investment Corporation
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
GWh	Giga Watt Hours
GWP	Global Warming Potential
I	Interview
IETA	International Emission Trading Association
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
Kw	Kilo Watt
kWh	Kilo Watt Hours
LoA	Letter of Approval
MP	Monitoring Plan
NCV	Net Calorific Value
NDRC	National Development and Reform Commission of China
NECG	Northeast China Grid
NGO	Non-governmental Organization
ODA	Official Development Fund
OM	Operating Margin
PDD	Project Design Document
SD	Sustainable Development
SEPA	State Environmental Protection Administration of China
SERC	State Electricity Regulatory Commission of China
t	Tonne
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added Tax
ZNED	Zhongdiantou Northeast New Energies Development Co., Ltd.

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## 1 EXECUTIVE SUMMARY – VALIDATION OPINION

The validation team of TÜV Rheinland Japan Ltd., TÜV Rheinland Group (TÜV Rheinland) has performed a validation of the “Liaoning Beipiao Beitazi | Wind Farm Project” in P.R.China on the basis of UNFCCC criteria for Clean Development Mechanism (CDM) projects according to Article 12 of the Kyoto Protocol and subsequent decisions of the CDM Executive Board with regard to CDM modalities and procedures and the application of approved methodologies. The validation report and the validation protocol are summarizing the findings of the validation.

The review of the project design documentation and the subsequent follow-up interviews have provided DOE with sufficient evidence to determine the fulfilment of stated criteria.

The Validation was executed in the following steps so far:

- Desk review of preliminary PDD (Version 01, 20<sup>th</sup> January 2008)
- Public stakeholder comment process (6<sup>th</sup> February 2008 to 6<sup>th</sup> March 2008)
- On-site visit with stakeholder interviews (1<sup>st</sup> April to 3<sup>rd</sup> April 2008)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol
- Desk review of revised PDD (Version 02.2, 22<sup>nd</sup> October 2008, Version 02.3, 15<sup>th</sup> April 2009, Version 02.4 of 25<sup>th</sup> May 2009, Version 02.5 of 20<sup>th</sup> June 2009, Version 02.6 of 9<sup>th</sup> July 2009 and Version 02.7 of 27<sup>th</sup> November 2009)
- Review of proposed correction and clarifications
- Issue of the final validation report & protocol

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The host country of the proposed project is P.R.China. The Letter of Approval (LoA) of voluntary participation, including confirmation by China's DNA – National Development & Reform Commission (NDRC), that the project assists them in achieving sustainable development has been received.

The project activity is bilateral CDM-project, with Germany identified as the Annex I party. The Letter of Approval (LoA) from the DNA of Germany, Umweltbundesamt Deutsche Emissionshandelsstelle, to authorize the KfW as the Project participant, has been received.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards China.

By utilizing renewable wind power resources, the project results in CO<sub>2</sub>e reductions 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 project applies approved baseline and monitoring methodology ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 7)

And also the project applies the tools as follows:

- Tool to calculate the emission factor for an electricity system (Version 01.1)
- Tool for the demonstration and assessment of additionality (Version 05.2)

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The total emission reductions from the project are estimated to be on the average 126,010 tCO<sub>2</sub>e per year over the first 7-year 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.

Adequate monitoring procedures have been implemented according to the monitoring methodology ACM0002 Version 7. Training plan is available and the training program has been started since October 2006.

The project proponent has resolved all Corrective Action Requests and Clarification Requests as stated in the Validation Report and the Validation Protocol, which has resulted in a revision of the PDD. In summary, it is validation team's opinion that the Liaoning Beipiao Beitazi | Wind Farm Project at Xiaodianzi village, Beita County, Beipiao City, Liaoning Province, P.R.China, as described in the PDD of Version 02.7 of 27<sup>th</sup> November 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria applies the baseline and monitoring methodology ACM0002 (version 7). The validation team of TÜV Rheinland Japan Ltd. thus recommends the proposed project to be registered as a CDM project activity with the UNFCCC.

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## 2 INTRODUCTION

The China Power Complete Equipment Co., Ltd. has commissioned TÜV Rheinland Japan Ltd. (TÜV Rheinland) to perform a validation of the Liaoning Beipiao Beitazi | Wind Farm Project in P.R.China (hereafter called “the Project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting, UNFCCC criteria refer to Article 12 of the Kyoto Protocol, and the subsequent decisions by the CDM Executive Board.

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### 2.1 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).

### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 07. The validation team has, based on the recommendations in the Validation and Verification Manual, ensured a thorough, independent assessment of proposed project activities submitted for registration as a proposed CDM project activity against applicable CDM requirement.

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.

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### 3 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 and opinion.

The following sections outline each step in more detail.

#### 3.1 Desk Review of the Project Design Documentation

The following list outlines the documentation reviewed during the validation:

- /1/. CDM Development Centre of China Power Complete Equipment Co., Ltd., Project Design Document for Liaoning Beipiao Beitazi | Wind Farm Project, Version 01 of 20<sup>th</sup> January 2008, Version 02.2 of 22<sup>nd</sup> October 2008, Version 02.3 of 15<sup>th</sup> April 2009, Version 02.4 of 25<sup>th</sup> May 2009, Version 02.5 of 20<sup>th</sup> June 2009, Version 02.6 of 9<sup>th</sup> July 2009 and Version 02.7 of 27<sup>th</sup> November 2009.
- /2/. CDM Executive Board, Clean Development Mechanism Validation and Verification Manual, Annex 3/EB44, 28<sup>th</sup> November 2008.
- /3/. CDM Executive Board, ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 07, 30<sup>th</sup> November 2007.
- /4/. CDM Executive Board, Tool for the demonstration and assessment of additionality, Version 05.2, 26<sup>th</sup> August 2008.
- /5/. CDM Executive Board, Tool to calculate the emission factor for an electricity system, Version 01.1, 29<sup>th</sup> July 2008.
- /6/. CDM Executive Board, Guidance on Demonstration and Assessment of Prior Consideration of the CDM (EB41/Annex 46), 2<sup>nd</sup> August 2008.
- /7/. The Project’s EIA report on December 2006 by Liaoning Academy of Environmental Sciences and the Approval Letter on 30<sup>th</sup> March 2007 by Liaoning Environmental Protection Administration.
- /8/. The Project’s FSR report (No.21-Q249) on July 2007 by Liaoning Electric Power Survey & Design Institute and the Approval Letter on 22<sup>nd</sup> August 2007 by Liaoning Provincial Development and Reform Commission [2007]No.791.
- /9/. China Power Complete Equipment Co., Ltd., Emission Reduction Purchase Agreement between Zhongdiantou Northeast New Energies Development Co., Ltd. and KfW, 14<sup>th</sup> December 2007.
- /10/. IPCC: Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories Reference Manual, 2006.
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- /16/. Chinese DNA's Baseline Emission Factor Calculation Result of China Grid, 9<sup>th</sup> August 2007  
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<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1374.pdf>
- /17/. Industry and Commercial Bank of China, Loan Commitment Letter for the Project, 10<sup>th</sup> March, 2008.
- /18/. China Construction Bank, Loan Commitment Letter for the Project, 10<sup>th</sup> March 2008.
- /19/. China Power Complete Equipment Co., Ltd., Request Letter for CDM Development and Bundling Sale of 10 Wind Power Projects (Including Liaoning Beipiao Beitazi | Wind Farm Project) (CPCEC[2007] No.53), 4<sup>th</sup> June 2007.
- /20/. China Power Investment Corporation, Approval Letter CDM Development and Bundling Sale of 10 Wind Power Projects (Including Liaoning Beipiao Beitazi | Wind Farm Project) (CPI[2007] No. 191), 4<sup>th</sup> July 2007.
- /21/. Heilongjiang Runhua Electrical Engineering Project Management Co., Ltd., Project Construction Starting Permission Letter, 20<sup>th</sup> September 2007.
- /22/. Zhongdiantou Northeast New Energies Development Co., Ltd., Wind Turbine Generator Purchasing Contract between the project owner an Xinjiang Goldwind Science & Technology Co., Ltd., 26<sup>th</sup> September, 2007
- /23/. China Power Complete Equipment Co., Ltd., CDM Consultant Service Contract, 29<sup>th</sup> January 2008.
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- /25/. Liaoning Provincial Development and Reform Commission, Approval Letter on Project Owner Alteration for the Project, 19<sup>th</sup> Dec. 2007
- /26/. Liaoning Provincial Power Grid Co., Ltd., Approval Letter on Electrical System Engineering of Beipiao Beitazi Windfarm in Project FSR [2007] No.197, 23<sup>rd</sup> April 2007.
- /27/. CDM Development Centre of China Power Complete Equipment Co., Ltd., Project IRR calculation spread sheet, 22<sup>nd</sup> October 2008 and 9<sup>th</sup> July 2009.
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- /29/. CDM Development Centre of China Power Complete Equipment Co., Ltd., CDM training records, October 2006.
- /30/. CDM Executive Board, Project Design Document Form (CDM- PDD) Version 03, 28 July 2006.  
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- /60/. Zhongdiantou Northeast New Energies Development Co., Ltd., Land Compensation Agreement.
- /61/. China New Energy Net, Tariff List for Windfarm Projects in China, 21<sup>st</sup> December 2004  
<http://www.newenergy.org.cn/html/00412/20041605.html>, accessed on 24<sup>th</sup> October 2008.
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- /77/. Mr. Wang Shu, Reply to Email Regarding the Authenticity of LoA of Liaoning Beipiao Beitazi | Wind Farm Project, 20<sup>th</sup> May 2009.

Main changes between the version published for the 30 days stakeholder commenting period and the final version submitted for registration:

- PDD is revised according to the CARs and CLs identified in the TÜV Rheinland's Draft Validation Report to the Project;
- The data sources for the baseline emission factor calculation of Northeast China Power Grid have been updated to the latest data that was published by Chinese DNA dated on 18<sup>th</sup> July 2008;
- Tool for the demonstration and assessment of additionality has been updated from Version 4 to Version 05.2.

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### 3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/i/	2008-04-01	Mr. ZHANG Baodong	Zhongdiantou Northeast New Energies Development Co., Ltd.	<ul style="list-style-type: none"> <li>➤ Project Management</li> <li>➤ Technical issues</li> <li>➤ Approval status by the host country</li> <li>➤ Sustainable development issues</li> <li>➤ Investment risks and barriers</li> <li>➤ Equipment management</li> <li>➤ Additionality</li> <li>➤ Monitoring plan</li> <li>➤ Training record</li> <li>➤ Environmental impacts</li> <li>➤ Stakeholder process</li> </ul>
/ii/	2008-04-01	Ms. MENG Jing	China Power Complete Equipment Co., Ltd.	<ul style="list-style-type: none"> <li>➤ Baseline determination</li> <li>➤ Methodology related issues</li> <li>➤ Additionality</li> <li>➤ Common practice analysis</li> <li>➤ Emission reductions calculation</li> <li>➤ monitoring plan and project management</li> <li>➤ Environmental impact</li> <li>➤ Stakeholder process</li> </ul>
/iii/	2008-04-01	Mr. WANG Xuewei	Development and Reform Commission of Beipiao City	<ul style="list-style-type: none"> <li>➤ Power industry development in Liaoning Province</li> <li>➤ Approval status by the host country</li> <li>➤ Sustainable development issues</li> </ul>
/iv/	2008-04-01	Mr. LI Lianfu	Environment Protection Bureau of Beipiao City	<ul style="list-style-type: none"> <li>➤ Environmental impacts</li> <li>➤ Stakeholder process</li> </ul>
/v/	2008-04-01	Mr. LI Qingsong	Power Dispatching Bureau of Beipiao City	<ul style="list-style-type: none"> <li>➤ Power industry development in local area</li> <li>➤ Monitoring plan</li> </ul>
/vi/	2008-04-01	Mr. ZHANG Fengting	Villager	<ul style="list-style-type: none"> <li>➤ Environmental impacts</li> <li>➤ Job Opportunities</li> </ul>

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### 3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of two tables. The different columns in these tables are described in the figure below. The completed validation protocol for the [Liaoning Beipiao Beitazi | Wind Farm Project](#) is enclosed in Appendix A to this report.

Deleted: Liaoning Beipiao  
Beitazi | Wind Farm Project

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

- 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.

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**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 ( <b>OK</b> ), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> 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 ( <b>OK</b> ), or a <b>corrective action request (CAR)</b> 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**

### 3.4 Internal Quality Control

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

### 3.5 Validation Team

Role/Qualification	Last Name	First Name	Office
Team Leader/MEM	Zhang	Ning	Greenfield Environmental Consultants Ltd. <sup>1</sup>
Trainee/M.Eng	Ma	Libo	TÜV Rheinland (China) Ltd.
Technical Reviewer/PhD	Brinkmann	Manfred	TÜV Rheinland Japan Ltd.

<sup>1</sup> Mr. Zhang Ning is under contract with TR Japan as individual freelance CDM auditor.



## 4 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.

### 4.1 Approval and Participation

The project participants are Zhongdiantou Northeast New Energies Development Co., Ltd. (ZNNED) from China and KfW from Germany. Therefore the Project is a bi-lateral project. The Host Party China and the participating Annex I Party Germany meet the requirements to participate in the CDM.

The Letter of Approval (LoA)/43/ from the DNA of China, National Development and Reform Commission, to authorize the Zhongdiantou Northeast New Energies Development Co., Ltd. as the Project participant, has been received. It has been observed by validation team that the original English version and Chinese version of LoA from China have been issued in April and May 2008 respectively. However, it has been confirmed through email from official of China DNA/77/ that the received LoA is authentic and it has been documented according to relevant China DNA's regulations. Furthermore, the authenticity has also been further validated as indicated in the table below.

The Letter of Approval (LoA)/44/ issued by the DNA of Germany (Umweltbundesamt, Deutsche Emissionshandelsstelle), authorizes the KfW as Project participant. This LoA has been issued on the basis of the Validation Report Version 04, and the project participant KfW forwarded the LoA to the validation team on 2009-07-31. Upon validation of the LoA, this final Validation Report Version 4.1 has been prepared and issued. The DOE confirms that the validation of the LoA and resulting unconditional validation opinion is the only modification as compared to the Validation Report Version 04 submitted to the German DNA.

Project participants	1. Zhongdiantou Northeast New Energies Development Co., Ltd.	2. KfW
Parties involved	P.R.China(host)	Germany
APPROVAL		
LoA received	Yes	Yes
Reference to document	/43/	/44/
LoA received from	PP	PP
Validation of authenticity	Confirmed through accessing Website of China DNA for	The validation team has accessed the official website

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	Approval Projects List (Ref. No.1117) on 7 <sup>th</sup> October 2008 <a href="http://cdm.ccchina.gov.cn/Website/CDM/UpFile/File1949.doc">http://cdm.ccchina.gov.cn/Website/CDM/UpFile/File1949.doc</a>	of German DNA as referenced in the LoA (i.e. <a href="http://jicdm.dehst.de/promechg/pages/project1.aspx">http://jicdm.dehst.de/promechg/pages/project1.aspx</a> ) on 1 <sup>st</sup> August 2009 and is able to confirm the received LoA is authorized and credible.
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	Not Applicable	No
Project contribution to Sustainable Development	Yes	Not Applicable

The Modalities of Communications (MoC) of the Project has been received by the validation team and it was confirmed that the MoC was signed on 14<sup>th</sup> April 2009 according to the latest Modalities of Communication Form (F-CDM-MOC) Version 01 issued by EB45 on 13<sup>th</sup> February 2009. The validation team has contacted each authorized representatives of the project participants as indicated in the MoC by email and it has been confirmed that the contact details and signatory are authorized and credible.

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. This was confirmed by the Loan Commitment Letters from Industry and Commercial Bank of China/17/ and China Construction Bank/18/, which agree to approve loan to the Project with consideration of the expected CDM revenue to increase the financial return for the project activity. The total loan is expected to accounts for 80% of the total investment. The Project owner arranges by itself the other 20% of the total investment according to site interview. The total investment arrangement plan was also confirmed to be consistent in the Approval Letter of the Project FSR.

## 4.2 Project Design Document

The Project Design Document is based on the currently valid PDD template /30/ and is completed in accordance with the CDM Executive Board, Guidelines for Completing the Project Design Document (CDM-PDD) and the Form for Proposed New Baseline and Monitoring Methodologies (CDM-NM), Version 07 /31/.

## 4.3 Project Description

According to the PDD/1/ and FSR/8/, the Project involves installation and operation of 33 wind turbine generators in Beipiao County, Liaoning Province, China. The installed capacity of each unit is 1500 kW and the turbine lifetime is 20 years, which have been confirmed by validation team in the Wind Turbine Generator Purchasing Contract/24/. The total installation capacity is thus

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calculated as 49.5 MW (i.e. 33 Units\*1.5MW/Unit=49.5MW). The Project proposes the installation of Xinjiang Goldwind 77/1500 wind turbines, of which the technical specifications as listed in the PDD have been checked to be in line with the Wind Turbine Generator Purchasing Contract/24/. Each wind turbine is equipped with a turbine-transformer unit boosting voltage to 10 kV. All transformers are linked with the 10 kV suspension lines and are connected to 66 kV step-up station around the project site. The 66 kV step-up station will be connected to the Beipiao 220 kV substation through 51.98 km 66 kV transmission line. The description of grid connection system is confirmed to be in line with the Approval Letter on Electrical System Engineering of Beipiao Beitazi Windfarm [2007] No.197/26/ issued by Liaoning Provincial Power Grid Company Ltd. Therefore, the validation team is able to confirm the project descriptions have been completely and accurately provided in the PDD Version 02.7 of 27<sup>th</sup> November 2009/1/ according to the supporting evidence received during validation process.

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Being a renewable energy project, the project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO<sub>2</sub> emissions from electricity generation by fossil fuel power plants which are dominated in North-east China Power Grid. The Project is considered to contribute to the sustainable development of the local community and the host country by utilizing the renewable wind sources for power generation, and avoiding environmental pollutions including SO<sub>2</sub>, NO<sub>x</sub> and particulate matter from business-as-usual coal-fired power plant. According to the Management Representative of the Project/41/, the Project is expected to create a totally 17 full-time workers (i.e. 4 administration staff, 3 shifts with 6 operation staff and 6 maintenance staff). It has been verified during site visit with local villagers that many temporary employment positions are also provided to the local people during the construction period. In addition, local government will also benefit from the additional income tax for electricity sale of the project activity. It is thus concluded that the implementation of the project activity will help in achieving sustainable development in social, environmental and economic aspects for local community.

The expected operational lifetime of the project activity is 20 years. A renewable 7-year crediting period has been chosen for the Project, starting from 1<sup>st</sup> September 2009 or the date of registration, whichever is later. The emission reductions are estimated to be 126,010 tCO<sub>2</sub>e per year and totally 882,070 tCO<sub>2</sub>e over the first 7-year crediting period.

The construction of the Project was commenced on 20<sup>th</sup> September 2007, which was confirmed by the Construction Starting Permission Letter/21/. The Wind Turbine Generator Purchasing Contract/24/ was signed between the project owner and Xinjiang Goldwind Science & Technology Co., Ltd. on 26 September 2007, which is after the construction starting date. Therefore, the construction starting date “20<sup>th</sup> September 2007” is justified as the project starting date representing the earliest date on which the real action begins. According to the onsite interview with Mr. Zhang Dongbao/i/ (Project Manager), the project construction was stopped during the cold winter period at the end of the year 2007, and was restarted in March 2008. The Project was still under civil construction during onsite assessment. The Project is expected to put into trail run at the end of the year 2008 according to the interview with the project manager/i/. The Approval Letter on Electrical System Engineering of Beipiao Beitazi Windfarm [2007] No.197 /26/ issued Liaoning Provincial Power Grid Co., Ltd. on 23<sup>rd</sup> April 2007, has been verified by validation team that the Liaoning Provincial Grid Company has initially agreed the electrical connection scheme to be connected with the Liaoning Provincial Grid. The Power Purchase Agreement (PPA)/69/ between Liaoning Provincial Power Grid Co., Ltd and ZNNED was signed on 24<sup>th</sup> July 2008. It has been confirmed in the PPA that the gate-way meters will be installed at the 10/66kV substation around the project site, where the installations have been clearly identified in Fig. B-1 in the revised PDD.

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According to onsite interview, the Management Representative of the Project has received CDM training by CPCEC in October 2006. The training material/29/ has been reviewed by validation team during site visit. A training program/28/ was compiled by the project owner and was planned for the management representative, technical staff, and operational and maintenance staff. The training program mainly consists of five parts: 1) Required training by the Grid Company; 2) Special work including climbing and driving; 3) Technical training on operation of windfarm projects; 4) CDM Training especially on operation and monitoring requirement; 5) Internal Training including safety training, management training, and expert lecture etc. The training plan was also identified in the PDD. Therefore, it has been demonstrated to validation team that all the staff involved in the Project was expected to receive sufficient training after it was put into commercial operation.

<i>Starting date of Project</i>	<i>Justification of and evidences (references) on the starting date of project</i>	<i>Expected project operational lifetime</i>	<i>Crediting period</i>
2007-09-20	Construction Starting Permission Letter/21/	20 years 0 month	Renewable 7 years crediting period starting from 1 <sup>st</sup> September 2009, or the date of registration, whichever occurs latter.

## 4.4 Baseline Determination

### 4.4.1 Applicability of the Selected Methodology to the Project Activity

The project applies the approved baseline methodology ACM0002 “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*” version 07/3/. It is considered that the applicability of this methodology is appropriate by meeting the applicability conditions as required by ACM0002, and the applicability has been validated as follows:

- 1) According to the Project FSR/8/, the Project is a new wind power plant to supply renewable electricity to the Northeast China Grid. It has been confirmed during site assessment that the Project is a green-field project, and there was no other power plant around the project site, and all the equipment of the Project is newly-purchased, with no equipment transferred from another project site;
- 2) As a wind power project, the Project does not involve switching from fossil fuels to a renewable energy source at the proposed site, which was confirmed through interview with the Mr. Wang Xuewei/iii/ as Head of Local Development and Reform Commission;
- 3) The electricity generated from the Project will be supplied to the Northeast China Power Grid through Liaoning Provincial Grid. The validation team has reviewed the *2008 Baseline Emission Factors for Regional Power Grids in China*, issued on 18<sup>th</sup> July 2008 by Chinese DNA/38/, which confirms that the NECG consist of Heilongjiang, Jilin and Liaoning provincial grids. Therefore, the geographic and system boundaries for the electricity grid (NECG) to which the proposed project will be connected can be clearly identified.

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## 4.4.2 Project Boundary

The project boundary is defined as the site of the project activity and all power plants connected physically to the northeast power grid including the Heilongjiang, Jilin and Liaoning provincial grids to which the project is connected according to *Approval Letter on Electrical System Engineering of Beipiao Beitazi Windfarm [2007] No.197/26/*. This is in line with the delineation of grid boundaries as provided by the DNA of China/38/. The defined project boundary is also in line with ACM0002/3/.

The NECG is dominated by coal-fired power plants as per the *China Electrical Power Yearbook 1999~2007/11/* and *China Energy Statistical Yearbook 2004~2007/12/*. 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 within NECG. Since the installed capacity is only 49.5MW, the renewable capacity additions will not have significant effects on the mix of the NECG during the project operation period.

The Project was under civil construction (i.e. turbine foundation construction) and the wind turbines have not been transported to site during site assessment. Fossil fuels have been used for land excavation, foundation treatment and transportation of construction materials etc. However, these emissions, arising from power plant construction, fuel handling, need not be considered as leakage according to ACM0002 Version 07/3/. No fossil fuels consumption will be required for normal operation of the wind power generators according to the project owner/i/.

Therefore, the identified boundary and the selected sinks and sources of greenhouse gases have been justified for the project activity in the PDD according to the applied methodology.

	<i>GHGs involved</i>	<i>Description</i>
<i>Baseline emissions</i>	<i>CO<sub>2</sub></i>	Main emission sources as the baseline is the Northeast China Grid
<i>Project emissions</i>	--	No fossil fuel consumptions have been identified for operation of wind power plant during site assessment. The internal electricity consumptions will be imported from the Grid, where the internal consumptions will be deducted from the generating output.
<i>Leakage</i>	--	Emissions, arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), are not required to be considered as leakage according to ACM0002 Version 07.

## 4.4.3 Baseline Identification

Since the Project is a new grid-connected wind power plants, the baseline scenario is justified as the 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

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reflected in the combined margin (CM) calculations described in the “*Tool to calculate the emission factor for an electricity system*” version 01.1. The baseline identification in the revised PDD is conducted in accordance with ACM0002 Version 07/3/.

The ex-ante estimation method was selected for the OM and BM emission factor based on the information derived from China Energy Statistical Yearbooks 2004~2007/12/ and China Power Electric Power Yearbooks 1999~2007/11/, which was confirmed to be the most recent information at the time of submission for validation. The baseline emissions calculations are conducted in accordance with the latest Guidance on Determination of OM and BM Emission Factor of Chinese Power Grid has been published by China DNA on 18<sup>th</sup> July 2008/38/.

<i>The approved baseline methodology applicable to the project</i> - explicit criteria - implicit criteria (e.g. available scenarios, applicability of formulas for BE/PE/LE calculations)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>PDD includes all assumptions and data used by project participants</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>All the references and documents used are relevant for establishing the baseline scenario</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>All the references and documents used are correctly quoted and conservatively interpreted in the PDD</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>All relevant policies / regulations considered are listed in the PDD</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>Identified potential baseline scenarios reasonably represent what would/could occur in the absence of the proposed project activity</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	No other potential baseline scenarios need to be considered according to ACM0002 Version 07.
<i>The baseline scenario selection is appropriate and determined according to the methodology</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>The approved methodology used is applicable to the identified baseline scenario</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

## 4.5 Additionality

### 4.5.1 CDM Consideration

Regarding the CDM consideration, the project development history was demonstrated in the revised PDD. Following the latest Guidance on the Demonstration and Assessment of Prior Consideration of the CDM/66/ issued on EB41, the validation team has cross-checked the “key events” with the evidence received during validation and the findings regarding the project implementation timeline and CDM development timeline are summarized below.

#### Project Implementation Timeline

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Date	Description	Reference of Evidence
2007.07	The CDM revenue has been considered during investment analysis to overcome the investment barriers for the project activity according to the Project FSR issued in July 2007. The Project FSR was prepared by Liaoning Electrical Power Survey & Design Institute, which is an independent entity for electrical power design accredited by Chinese Government.	/8/
2007.07.04	CPI replied to the Request Letter from CPCEC, and approved CPCEC taking in charge of the CDM Development and CER Bundling Sale for 10 Wind Power Projects (Including Liaoning Beipiao Beitazi   Wind Farm Project).	/20/
<b>2007.09.20</b>	<b><i>The construction of the project activity was started, which was evidenced in the Construction Starting Letter issued by supervisory company.</i></b>	<b>/21/</b>
2007.09.26	The Wind Turbine Generator Purchasing Contract was signed between the project owner and Xinjiang Goldwind Science & Technology Co., Ltd.	/22/

#### CDM Development Timeline

Date	Description	Reference of Evidence
<b>2007.06.04</b>	<b><i>China Power Complete Equipment Co., Ltd. (CPCEC), as a subsidiary company of China Power Investment Corporation (CPI) specialised in engineering and equipment tendering service, proposed to the parent company CPI for CDM Development and CER Bundling Sale for 10 Wind Power Projects (Including Liaoning Beipiao Beitazi   Wind Farm Project).</i></b>	<b>/19/</b>
2007.07	The CDM revenue has been considered during investment analysis to overcome the investment barriers for the project activity according to the Project FSR issued in July 2007. The Project FSR was prepared by Liaoning Electrical Power Survey & Design Institute, which is an independent entity for electrical power design	/8/



	accredited by Chinese Government.	
2007.07.04	CPI replied to the Request Letter from CPCEC, and approved CPCEC taking in charge of the CDM Development and CER Bundling Sale for 10 Wind Power Projects (Including Liaoning Beipiao Beitazi I Wind Farm Project).	/20/
2007.12.14	The Emission Reduction Purchasing Agreement (ERPA) was signed between the project owner and KfW.	/9/
2008.01.29	The CDM Consultant Service Contract was signed between the project owner and CPCEC.	/23/
2008.02.06	The PDD of the Project was published on the UNFCCC website for global stakeholder comments.	<a href="http://cdm.unfccc.int/Projects/Validation">http://cdm.unfccc.int/Projects/Validation</a>
2008.04	The Letter of Approval from China DNA (Original English Version) was received.	/43/
2008.05.19	The Letter of Approval from China DNA (Original Chinese Version) was received.	/43/

From the timeline listed above, the construction starting date of “20<sup>th</sup> September 2007” was justified as the earliest date of real action implementation according to the latest Guidance on Completing Project Design Document/31/. The CDM revenue has been considered to overcome the investment barriers for the project activity at the beginning of the project design according to the Project FSR issued in July 2007. In order to alleviate the finance pressure of the proposed project, the project owner has invited international buyer tendering for expected CER which will be generated by the project activity on 4<sup>th</sup> July 2007, which was confirmed in the *Request Letter for CDM Development and Bundle Selling of 10 Wind Power Projects (Including Liaoning Beipiao Beitazi I Wind Farm Project)/19/* by CPCEC on 4<sup>th</sup> June 2007 and *Approval Letter by China Power Investment Group Co., Ltd./20/* on 4<sup>th</sup> July 2007. The project owner (Zhongdiantou Northeast New Energies Development Co., Ltd.) and consultant company (CPCEC) are both the subsidiary company of China Power Investment Company. Moreover, CPCEC, on behalf of the project owner, was assigned by the mother company to take charge of CDM development work for the wind power projects including PDD developing, ERPA negotiation and validation. The ERPA/9/ and CDM Consultant Service Contract/23/ have been checked by the validation team to be effective.

**In summary, it has been sufficiently demonstrated that CDM revenue of the project activity was essential for the decision to proceed with the investment in the Project before the project starting date.**

<i>Starting date of project</i>	<i>Justification of and evidences (references) on the starting date of project</i>	<i>Date of CDM consideration</i>
2007-09-20	Construction Starting Permission Letter of the Project/21/	2007-06-04



## 4.5.2 Alternatives

The additionality of the project has been established using the “*Tool for the demonstration and assessment of additionality*” version 05.2/4/ approved by the CDM-EB meeting.

The alternate scenarios for the project activity have been suitably identified as follows:

- a) The proposed project itself, but undertaken without being registered as a CDM project activity;
- b) Construction of a fossil fuel-fired power plant with equivalent amount of annual electricity generation;
- c) Construction of a power plant using other renewable energy with equivalent amount of annual electricity generation;
- d) Equivalent electricity service provided by the Northeast China Grid.

Alternative b) does not comply with the current Chinese regulations, which was confirmed by the validation team that construction of fossil fuel-fired power plants with the installed unit capacity equal to or lower than 135MW/14/ is prohibited in the areas which can be covered by large grids such as provincial grids. Therefore, Alternative b) is not a realistic and credible alternative.

Alternative c) comply with the current Chinese regulation, the feasibility of other renewable power plant has been cross-checked through site interview with the Mr. Wang Xuewei/iii/ as the Official from Development and Reform Commission of Beipiao City), who has confirmed other renewable power plants were not financial attractive in local area. There is not economically viable hydro resources around the project site according to Hydro Resources Distribution Chart in China/49/. The geothermal resources in Northeast China are not abundant and are only feasible for heat utilization instead of power generation/52/. The solar energy with similar installed capacity is not economically attractive since the generation cost is much higher than other kinds of power plant/50/. Most of the biomass including maize and straw is utilized for cooking in local area according Mr. Wang Xuewei/iii/, and the biomass plant is not financial attractive either due to high generating cost and limited biomass resources/51/. Furthermore, the project owner is a new company which is dedicated to windfarm projects development in Northeast China. The project owner had no experiences and ability to develop biomass power plant. The supporting reference information in the revised PDD has been checked by the validation team through accessing on website dated on 17<sup>th</sup> October 2008 and was deemed as credible evidence for exclusion of other renewable energy alternative.

Alternative d) comply with the current regulations and economically feasible, and reflects the real condition in local area which has been verified by validation team through onsite interview. Thus, the Alternative d) is a realistic and credible alternative for the proposed project.

**Therefore, the proposed project activity is not the only alternative amongst the ones considered by the project participants that is in compliance with mandatory regulations with which there is general compliance, the Project may be additional as further discussed in the followings.**

## 4.5.3 Investment Analysis

The validation team has reviewed the investment analysis conducted for the project activity and confirmed the suitability of the method applied in the revised PDD/1/. As the proposed project generates financial and economic benefits through the sales of electricity other than CDM related

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income, a simple cost analysis can not be applied. The benchmark analysis is selected for conducting the investment analysis.

### **Benchmark Selection**

According the project FSR/8/ and PDD/1/ (with IRR spread sheet), the project IRR (after tax) was selected for benchmark comparison. It has been demonstrated in PDD that the benchmark is selected as 8% (After Tax) according to *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects/13/* issued by former State Power Corporation of China in 2003. The validation team has reviewed the source of the 8% benchmark - *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, which is deemed an appropriate benchmark reference for the retrofit power projects and new power projects investment in China. Moreover, it has been commonly adopted for financial evaluation for the registered wind power CDM projects in China (<http://cdm.unfccc.int/Projects/registered.html>). The benchmark analysis is intended for post tax comparison and this is in accordance with the *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects/13/*.

### **Calculation and Presentation**

The validation team has confirmed the IRR calculations are conducted according to the Feasibility Study Report/8/. The Project FSR was prepared by Liaoning Electrical Power Survey & Design Institute, which is a professional independent entity for electrical power project design accredited by Chinese Government. Therefore, the parameters and assumptions from FSR can be considered information provided by an independent and recognized source. The time gap between FSR accomplishment (July 2007) and project starting date (20<sup>th</sup> September 2007) is within 3 months, which represents the input values from FSR were the latest available data for the project owner to make decisions to proceed with the investment in the Project. Moreover, no material changes of the input values are expected within 1 year.

The major input values and the IRR calculation has been validated according to the Guidance on the Assessment of Investment Analysis/39/ issued on EB41 meeting and the findings are discussed in details below:

- **Assessment Period**

The project IRR after tax was selected as reference to demonstrate the financial viability in the PDD. Assessment Period applied in IRR spread sheet is selected as 21 years including 1-year construction period which in accordance with the *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects/13/* and deemed to be appropriate. The installed capacity and operational lifetime was in line with the technical specifications of the wind turbine generators according the equipment purchasing contracts/22/.

- **Taxes**

The validation team confirmed that the input values of necessary tax were suitably adopted in accordance with *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*. Since the Project is new wind power project, the VAT was selected as 8.5%, which was confirmed in the *Notice on VAT of Resources Comprehensive Utilization and Other Products/34/* issued by Ministry of Finance and State Administration of Taxation on 1<sup>st</sup> December 2001. According to the *Enterprise Income Tax Law/35/* issued by Chinese Government on 16<sup>th</sup> March 2007 (Effective

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since 1<sup>st</sup> January 2008), the income tax rate was selected as 25% and confirmed to be appropriate at the time of FSR design.

- Total Static Investment

As demonstrated in the FSR, the total static investment was calculated in accordance with local policy and price level of Liaoning Province at the fourth quarter of 2006, which had no material change compared with the year 2007 according to the material price information available at the official website of Liaoning Provincial Price Bureau/48/ and deemed to be reasonable at the time of project starting date (i.e. 20<sup>th</sup> September 2007). The assumptions and parameters were adopted from *Method and Standard of Investment Evaluation for Windfarm Engineering Feasibility Study Report and Parameters for Electrical Power Engineering Construction* which were effective at the time of FSR design. The total static investment for the Project was verified as 486.96 Million RMB in the FSR Approval Letter/8/ by Liaoning Provincial Development and Reform Commission, which was in line with the FSR and PDD. Furthermore, the main engineering cost, which involves cost of wind turbines, turbine tower, turbine transformer and transmission engineering, has been checked and the validation team has carried out an independent comparison between the FSR estimated cost and the actual cost which has been confirmed in the available evidence. The actual investment cost of main equipment, as evidenced in the contracts of the wind turbine, turbine tower, turbine transformer, and transmission engineering, has been listed and compared with the estimated FSR values in the table below. The comparison has demonstrated that there is small gap (i.e. 0.87% of the total static investment) between the FSR estimated costs and the actual equipment costs, while these equipment costs have aggregated to be around 83% of the total static investment. Therefore, the validation team could confirm that the static investment has been appropriately estimated in the FSR based on the available contracting documents.

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**Estimated and Actual Engineering Cost Comparison (Unit: RMB)**

Item	FSR Estimated (F)	Actual Cost (A)	Reference
Wind Turbines	314,325,000	315,667,816	/22/
Turbine Tower	42,108,000	38,768,500	/67/
Turbine Transformer	8,654,250	6,204,000	/68/
Transmission Engineering	39,210,000	39,419,000	/66/
<b>Total</b>	<b>404,297,250</b>	<b>400,059,316</b>	-
<b>Percent of Total Static Investment</b>	<b>404,297,250/486,960,000 *100%=83.02%</b>	<b>400,059,316/486,960,000 *100%=82.15%</b>	-
<b>Differences</b>	<b>83.02%-82.15%=0.87%</b>		-

- Electricity Output

According to the FSR/8/, the wind power resources are assessed by *GB/T 18710.2002 Wind Resources Assessment Method for Windfarms* on the basis of 30 years regional wind resources statistics and 1-year onsite wind measurement at the proposed project site starting from 1<sup>st</sup> June 2005 to 31<sup>st</sup> May 2006. Furthermore, the wind turbine generator manufacturer's On-grid Electricity Output Report/41/ in August 2007 has been provided to the validation team. The electricity output calculation results were in line with the FSR and PDD. The allocation and technical performance of each wind turbine generator within the windfarm has been monitored and

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analyzed in the On-grid Electricity Output Report. The annual electricity output was estimated with the WAsP and WIND FARMER software and calculated as 155,575 MWh eliminating the wake impact. Considering the factors including the wind turbine availability (95%), Rotor Blade Soiling Loss (3%), transmission loss & auxiliary consumption (7%), and control & turbulence influence (4%) etc., the annual on-grid output is estimated as 110,458 MWh with a 29% loss factor.

The validation team has reviewed the “*Clarification on Energy Loss Factors of Liaoning Beipiao Beitazi Wind Farm Project*”/75/ from Liaoning Electrical Power Survey & Design Institute, which elaborates the energy loss factors have been determined according to the technical specifications of the Project and relevant national standards (e.g. *Code on Compiling Feasibility Study Report of Wind Power Projects DLT 5067-1996*). The validation findings are summarized below.

Item	Values	Justification by Validation Team
Turbine Availability	95%	It has been confirmed by checking Page 67 of the “Wind Turbine Purchasing Contract”/22/ that the equipment supplier (i.e. Goldwind Science & Technology Co., Ltd.) shall assure the turbine availability above 95%. Therefore, it is reasonable to select 95% of turbine availability for the proposed project.
Power Curve Adjustment	5%	It has been confirmed by checking Page 67 of the “Wind Turbine Purchasing Contract” /22/ that the equipment supplier (i.e. Goldwind Science & Technology Co., Ltd.) shall assure the power curve conformance above 95%. Therefore, it is reasonable to select 5% loss of power curve adjustment.
Rotor Blade Soiling Loss	3%	The project site is located at wind sandy area and the rotor blade surface roughness will increase along with wind turbine operation. The rotor blade soiling loss is selected as 3%, which also takes references from nearby wind power projects.
Transmission Loss & Internal Consumption	7%	It has been confirmed that the transmission loss & internal consumption is calculated by considering the transformer loss from the main transformer (500MVA) and turbine transformers (1600KVA for each turbine), and transmission loss of 33.2 km 10-kV transmission lines within project site. The total transmission loss & internal consumption is calculated as 10,423MWh, which about 6.7% of the theoretical output 155,575 MWh. Therefore, it is reasonable to select 7% as the total transmission Loss & internal consumption.
Turbulence & Control Impact	4%	The turbulence & control impact is estimated as 4% by considering the turbulence intensity within 15m/s area at the height of 70m above ground (i.e. 9.49%).
Low Temperature Impact	3%	The low-temperature below -10°C will cause shutdown or outage due to the weak circulation of lubricating oil. It has

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		been confirmed by validation team that the Project is located at high-latitude cold area in China. The minimum temperature is -28.2°C according to local weather station, as also reported in Page 19 of FSR. Therefore, the low temperature impact is selected as 3% and deemed to be reasonable.
Other Impacts	2%	The total planning capacity of the wind farm is 100MW according to the FSR, which consists of 2-phase construction. Other impacts are considered as the trailing flow influences from the expanding wind turbines which will be installed in the future.

Furthermore, the total energy loss factor of the Project (i.e. 29%) is confirmed to be reasonable by comparison with other wind power projects within Liaoning Province as indicated below, of which the feasibility study is also completed by Liaoning Electrical Power Survey & Design Institute.

Project Title	Installed Capacity (MW)	Average Wind Speed at 70m (m/s)	Annual On-grid Output (MWh)	Energy Loss Factors
<i>Beipiao Beitazi I Windfarm</i>	49.5	7.3	110,458	29%
Heishan Fangshan Windfarm	49.5	7.5	106,639	33%
Heishan Yangtun Windfarm	49.5	7.5	104,392	33%
Beipiao North Sijiaz I Windfarm	49.5	7.34	111,860	32%
Zhangwu West Dayingzi Windfarm	49.5	7.2	109,181	29%
Zhangwu Mazongshan Windfarm	49.5	7.3	113,032	29%
Zhangwu Qujiagou Windfarm	49.5	7.2	103,346	27%

Since Liaoning Electrical Power Survey & Design Institute is third-party design entity accredited by Chinese Government and qualified for project design of wind power projects, the energy loss factors of other wind power projects listed above are deemed to be appropriate under the context of the project activity. Therefore, the validation team is able to confirm that the energy loss factor of the Project has been appropriately estimated/8/.

The annual on-grid output is estimated as 110,458 MWh with a load factor of 0.255, which is further confirmed to be appropriate through comparison with other registered CDM wind power projects in Liaoning Province as listed in the table below.

#### Load Factors of Registered CDM Windfarm Project in Liaoning Province

Ref.	Project Title	Installed Capacity	Annual On-grid Output	Load Factor
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			(MW)	(MWh)	
0539	Liaoning Zhangwu Wind Farm Project <sup>2</sup>	24.65MW	24.65	51,414	23.8%
0537	Liaoning Kangping Wind Farm Project <sup>3</sup>	24.65MW	24.65	54,230	25.1%
0883	Liaoning Changtu Windfarm Project <sup>4</sup>		49.5	90,886	20.96%
1446	Liaoning Xingcheng Haibin Wind Farm Project <sup>5</sup>		49.5	111,077	25.6%
1501	Liaoning Huanren Niumaodashan Wind Power Project <sup>6</sup>		24.65	53,930	24.8%
2149	Diaobingshan New-built 49.5MW Wind Power Station Project <sup>7</sup>		49.5	93,555	21.6%

#### • Bus-bar Tariff

Bus-bar tariff was estimated as 0.501 RMB/kWh excluding VAT (or 0.544RMB/kWh including VAT) in the PDD and was in line with the Project FSR/8/. According to China Wind Power Report 2007/70/, the tariff of the wind farms in Liaoning Province should be approved as relatively higher fixed-tariff by local government (i.e. Liaoning Provincial Bureau) before the year of 2005. After the issuance of *Provisional Administrative Measures on Pricing and Cost Sharing for Renewable Energy Power Generation*/32/ in January 2006, the feed-in tariff for wind power projects shall follow the Guidance Price approved by National Development and Reform Commission (NDRC), with reference to the bidding tariff. However, it was confirmed that the NDRC's Guidance Tariff Notification for windfarm projects in Liaoning Province was only available since 3<sup>rd</sup> December 2007/37/. The tariff was determined as fixed 0.501 RMB/kWh (VAT Excl.) during the 20-year operational period in the FSR, which the FSR design institute (i.e. Liaoning Electrical Power Survey & Design Institute) considered realistic by evaluating the trend of the tariff and the local price level within Liaoning Province, as well as by referring to the bidding tariff of Windfarm Concession Projects during the year of 2003 to 2006/47/. The FSR was approved by Liaoning Provincial Development and Reform Commission on 22<sup>nd</sup> August 2007, representing that the economical assessment in the FSR (Including the tariff estimation) was initially agreed by local government authorities. Therefore, it is reasonable for the project owner to adopt the FSR estimated tariff at the time of investment decision, considering there is only 1 month gap between the FSR approval (i.e. 2007-08-22) and construction commencement (i.e. 2007-09-20).

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The validation team has also reviewed the Tariff Approval Letters/37/ by NDRC in 2007 and 2008 which indicate that for wind power projects within Liaoning Province, the bus-bar tariff shall be 0.61 RMB/kWh (VAT Included) for the first 30,000 full-load equivalent operational hours and the bus-bar tariff after namely 30,000 hours shall be executed according to the average tariff level in local region, which will be approved by National Development and Reform Commission. According to the Tariff Approval Letter/37/ by National Development and Reform Commission,

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<sup>2</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1154525743.09/view>

<sup>3</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1153828094.42/view>

<sup>4</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1169618157.26/view>

<sup>5</sup> <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1195741055.25/view>

<sup>6</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1199956532.2/view>

<sup>7</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1218622278.09/view>

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the first 30,000h is the accumulated full-load equivalent operational hours since the date on which the Project is put into commercial operation. Since the Project is located in Liaoning Province, the bus-bar tariff of the Project will be mostly likely to be approved at same tariff level with other newly approved windfarm projects in Liaoning Province. The latest approved tariff level for other windfarm projects within Liaoning Province/37/ has been applied during sensitivity analysis. The tariff of 0.3621 RMB/kWh is the yard-stick tariff of new coal-fired power plant with desulfurization system (i.e.  $0.3471 \text{ RMB/kWh} + 0.015 \text{ RMB/kWh}$  (subsidy for desulfurization system) =  $0.3621 \text{ RMB/kWh}$ )<sup>8</sup>, representing the average tariff level in Liaoning Province in 2007, which is dominated by coal-fired power plant. However, the project IRR would not exceed benchmark 8% (after tax) by applying 0.61RMB/kWh for the first 30,000 full-load hour and 0.3621 RMB/kWh for the subsequent operational hours.

The Power Purchasing Agreement (PPA)/69/ has been checked to be signed on 24<sup>th</sup> July 2008. The validation team has reviewed the PPA document and it has been illustrated in Chapter 3 of the PPA that the tariff of the Project shall be determined according to the government's approval. However, the tariff for the Project is still under approval and has not been approved by National Development and Reform Commission till 20<sup>th</sup> April 2009. Since the Project has been put into commercial operation, a temporary tariff was made for the Project by Liaoning Price Bureau on 12<sup>th</sup> November 2008 and temporarily applied yard-stick tariff of new coal-fired power plants with desulfurization system for the Project, which is much lower than the estimated tariff in the FSR (i.e. 0.544RMB/kWh including VAT). Therefore, the tariff has been appropriately estimated in the FSR and it is reasonable for the project participant to adopt the FSR estimated tariff (i.e. 0.501 RMB/kWh without VAT) at the time of investment decision.

**In summary, the IRR calculation was checked by validation team through conducting the calculation on the spread sheet provided by the CPCEC and it was confirmed that the computations have been correctly carried out and documented. The calculation results indicate that the project IRR (after tax) without CDM revenue is 6.58% which is lower than the Benchmark IRR (8%). The project IRR would reach 8.73% with consideration of CDM revenue. Therefore, the Project is unlikely to be financial attractive without expected CDM revenue.**

### Sensitivity Analysis

The sensitivity analysis, with four financial parameters (total static investment, annual O&M cost and annual on-grid output and tariff) selected and subjected to variations subjected to variations of +/-10%, has been reviewed and confirmed to be carried out in accordance with the requirements of "Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects"/13/. The calculation has been reviewed by the validation team during validation and confirmed that the sensitivity analysis has been carried out in accordance with the approved FSR. The results also show that the project IRR would exceed 8% with 10% reduction of total static investment or 11% increase of on-grid output or bus-bar tariff.

- The total static investment reduces by 10%; or
- The annual operational and maintenance cost decrease by 68%
- The tariff increases by 11%. or
- The on-grid output increase by 11%;

<sup>8</sup> [http://www.sdpc.gov.cn/zfdj/jggg/dian/t20060630\\_128823.htm](http://www.sdpc.gov.cn/zfdj/jggg/dian/t20060630_128823.htm)

Critical Condition	Justifications by Validation Team
Static investment reduces by 10%	The project IRR (after tax) would reach 8% when the total static investment of the Project would be unlikely to reduce since the industrial material prices including the steel/53/, cement and fuel cost/54/ kept increasing over the period of the year 2006~2008. The supporting referenced information in the revised PDD has been checked by the validation team to be valid. The validation team has also carried out a comparison of the industrial material price in the FSR with the information which were available on the official website of the Liaoning Provincial Price Bureau/48/. The material price was confirmed to be reasonably estimated. As discussed in Section 4.5.3 above, the actual investment costs of main equipment, as evidenced in the contracts of the wind turbine, turbine tower, turbine transformer, and transmission engineering, has only 0.87% difference from the FSR estimated values, while these main equipment costs have aggregated to 83% of the total static investment. Almost all the project investment has been in place, the total static investment of the Project is thus unlikely to reduce significantly.
Annual O&M cost reduces by 68%	It has also found that the project IRR would reach benchmark when the annual O&M cost reduces by 68%. According to the IRR spread sheet and FSR, the annual O&M cost involves the salary and welfare allowance, the material expenses, the repairs retained and other expenses which was calculated according to the <i>Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects/13/</i> . The annual O&M cost was confirmed to be appropriate through comparison with other registered CDM windfarm projects in Liaoning Province /56/~59/. Therefore, it is unlikely for the annual O&M cost to reduce significantly.
Tariff increases by 11%	The impact of the bus-bar tariff on the project IRR is similar with the impact of on-grid output. The project IRR (after tax) would reach 8% when the bus-bar tariff or on-grid output increases 11%. However, it has been confirmed by the validation team that the bus-bar tariff of the Project was expected to be approved as 0.61 RMB/kWh (VAT Included) for the 30,000 full-load equivalent operational hours and 0.3621 RMB/kWh after namely 30,000 hours, which was in accordance with the latest approved bus-bar tariff level for wind power projects in Liaoning Province/37/. Furthermore, the tariff of 0.61 RMB/kWh (VAT Included) has been assessed during sensitivity analysis in the revised PDD. It has confirmed by the validation team that the project IRR would reach 7.179% (after tax), which was still below the benchmark even with assumed tariff of 0.61

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	RMB/kWh (VAT Included) for the first 30,000 full-load equivalent operational hours and 0.3621 <sup>9</sup> RMB/kWh (VAT Included) after namely 30,000 hours. Furthermore, since the bus-bar tariff is regulated by the National Development and Reform Commission, it was unlikely for the tariff to increase significantly under the context of the project activity.
On-grid output increases by 11%	As demonstrated above, the on-grid output of the Project was estimated on the basis of 30 years regional wind resources statistics and 1-year onsite wind measurement at the proposed project site starting from 1 <sup>st</sup> June 2005 to 31 <sup>st</sup> May 2006. The Goldwind's On-grid Electricity Output Report/41/ dated in August 2007 has been provided to the validation team. The electricity output calculation results of Goldwind Science & Technology were in line with the FSR and PDD. According to the FSR and On-grid Output Report, the wind power resources of the Project were assessed on the basis of 30 years regional wind resources statistics. The 30-year average wind speed is assessed as 2.4 m/s <sup>10</sup> based on the historic statistics of local weather station, which was lower than the 1-year average wind speed 2.8 m/s during the onsite measurement period, which indicates that the wind power resources are unlikely to be underestimated by using the onsite measurement data during the period of 1 <sup>st</sup> June 2005 to 31 <sup>st</sup> May 2006. Therefore, it would be unlikely that the average annual on-grid output during the project operational lifetime would increase 11% compared with the estimated value in FSR.

**In summary, the investment analysis and sensitivity analysis have demonstrated to the DOE that the Project is unlikely to be financial attractive without consideration of the expected CDM revenue.**

#### 4.5.4 Barrier Analysis

Barrier analysis has not been selected to demonstrate the additionality.

#### 4.5.5 Common Practice Analysis

The common practice has been carried out towards comparable windfarm projects which are located within Liaoning Province according to the *China Windfarm Installed Capacity Statistics in 2007/36/* published by Mr. Shi Pengfei on February 28<sup>th</sup> 2008, which is deemed to be the latest information available during validation. The validation team has confirmed that the regulatory framework and investment environment for wind farm projects are only similar and comparable in the same Province. Furthermore, the wind resources and approved tariff are similar within the same province according to *2007 China Wind Power Report/70/*. Therefore, the validation team is able to

<sup>9</sup> [http://www.sdpc.gov.cn/zfdj/jggg/dian/t20060630\\_128823.htm](http://www.sdpc.gov.cn/zfdj/jggg/dian/t20060630_128823.htm)

<sup>10</sup> Both the 30-year average and 1-year average wind speed (i.e. 2.4m/s and 2.8m/s) are based on the measurement at the height of 10m above ground at local weather station.

Deleted: According to *Notice on Wind Power Construction and Management/71/* issued by China National Development and Reform Commission (NDRC), the provincial development and reform commission has the authority to approve wind power project with installed capacity below 50MW. For wind power projects with installed capacity above 50MW, it shall be approved by NDRC.

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confirm that the geographical scope for common practice has been appropriately adopted. The upper limit for the capacity range was not justified in the PDD. In fact, all the windfarms, which have been developed in Liaoning Province by the end of 2007 and were listed in the *China Windfarm Installed Capacity Statistics in 2007/36/*, have been considered in the PDD. It was confirmed by validation team that the largest windfarm considered for identification of similar projects is "Liaoning Fuxin Gaoshanzi" project with a total installed capacity of 100.5MW.

The validation has confirmed the similar windfarm projects were completely presented in Table B-6 of the PDD according to the *China Windfarm Installed Capacity Statistics in 2007/36/* and the findings are summarized below.

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Project Name (Province/City/Town)	Installed Capacity	Operation Starting Year	Remarks
Liaoning Dalian Hengshan	7.4MW	1993	RMB 0.9/kWh (Incl. VAT) <sup>11</sup>
Liaoning Wafangdian Donggang	22.45MW	1994	RMB 0.9154/kWh (Incl. VAT) <sup>11</sup>
Liaoning Linghai Yuji	3.75MW	1999	Small Pilot project
Liaoning Bayuquan Qu Xianrendao	33.66MW	1999	RMB 1.00/kWh (Incl. VAT) <sup>12</sup>
Liaoning Dandong Haiyanghong	21MW	2000	RMB 1.00/kWh (Incl. VAT) <sup>13</sup>
Liaoning Changhai Zhangzidao	3.0MW	2002	Small Pilot project supported by National debt/74/ <sup>14</sup>
Liaoning Changhai Xiaochangshan	3.6MW	2002	Small Pilot project supported by National debt/74/ <sup>14</sup>
Liaoning Changhai Dachangshan	3.6MW	2003	Small Pilot project supported by National debt/74/ <sup>14</sup>
Liaoning Faku Sijiazhi	9.6MW	2002	RMB 0.83/kWh <sup>15</sup>
Liaoning Faku Wanghaisi East	22.1MW	2007	At validation <sup>16</sup>
Liaoning Shenyang Faku Wanghaisi	20.4MW	2007	At validation <sup>17</sup>
Liaoning Kangping	24.65MW	2003	Registered <sup>18</sup>
Liaoning Zhangwu	24.65MW	2003	Registered <sup>19</sup>
Liaoning Changtu Dongzhangjia	49.5MW	2006	Registered <sup>20</sup>
Liaoning Changtu Quantou	49.3MW	2007	At validation <sup>21</sup>
Liaoning Huanren Pulepu	24.65MW	2006	Registered <sup>22</sup>
Liaoning Xingcheng Haibin	49.5MW	2008	Registered <sup>23</sup>

<sup>11</sup> <http://www.fenglifadian.com/fengdianzhishi/281GHFFD.html>

<sup>12</sup> <http://www.wvls.cn/law/32361.html>

<sup>13</sup> <http://www.wvls.cn/law/32341.html>

<sup>14</sup> <http://finance.people.com.cn/GB/1037/6036296.html>

<sup>15</sup> <http://finance.people.com.cn/GB/1038/59942/59949/6045289.html>

<sup>16</sup> <http://cdm.unfccc.int/Projects/Validation/DB/ZSH8OQVCIFJZEGCZ03EM7TYPYMQC1N/view.html>

<sup>17</sup> <http://cdm.unfccc.int/Projects/Validation/DB/R9XI9G6HV6GG3CS9RBSHBHLXGEZ7AO/view.html>

<sup>18</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1153828094.42/view>

<sup>19</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1154525743.09/view>

<sup>20</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1169618157.26/view>

<sup>21</sup> <http://cdm.unfccc.int/Projects/Validation/DB/287INEMJOF6XRG05RHSSUI87OCKMMB/view.html>

<sup>22</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1199956532.2/view>

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Liaoning Diaobingshan Gaoligou	49.5MW	2008	Registered <sup>24</sup>
Liaoning Fuxin Gaoshanzi	100.5MW	2008	At validation <sup>25</sup>

The windfarm projects, which have been published on the UNFCCC website for global stakeholder consultation, need not be considered for common practice according to the *Tool for the demonstration and assessment of additionality version 05.2/4/*. According to *China National Action Plan for Wind Power Industry Development/74/* published in June 2005, national debts were offered for the wind power projects at Changhai and Xianrendao in Liaoning Province since 2000. Besides, some small installations are mainly for pilot testing or demonstration purpose, which were supported by Chinese Government or foreign investment/70//74/. The Dalian Hengshan Windfarm, Wafangdian Donggang Windfarm, Bayuquan Qu Xianrendao Windfarm, Dandong Haiyanghong Windfarm and Faku Sijiazi Windfarm have enjoyed the beneficial policy and the tariff of these projects was much higher than the proposed project activity.

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In summary, the validation team has confirmed that there are essential distinctions between the project activity and other similar windfarm projects and the project activity is not common practice and is hence additional.

## 4.6 Monitoring

The project applies the approved monitoring methodology, ACM0002 *Consolidated baseline methodology for grid-connected electricity generation from renewable sources* (version 07)/3/. The selected monitoring methodology is applicable for the project and the monitoring plan is confirmed to be in line with the requirement as stipulated in the applied methodology/3/.

The project is a new grid-connected windfarm project, the project emissions are regarded as zero. No Leakage needs to be considered as per ACM0002 Version 7. Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime.

### 4.6.1 Parameters determined ex-ante

The baseline grid emission factor will be determined *ex-ante*, based on the most recent information available, and is calculated as a combined margin, consisting of the weighted average of the OM and BM emission coefficients. This combined margin emission coefficient will remain fixed during the first 7-year crediting period.

### 4.6.2 Parameters monitored ex-post

According to ACM0002, there are no project emissions or leakage from newly-built wind power project. Furthermore, it has been verified by validation team that all auxiliary electrical consumption comes from the grid, and there is no any other power sources within the project activity. Therefore, the net electricity generated from the project is the only parameter monitored *ex-post*.

The electricity imported and exported is measured by the main meter (i.e. gateway meter) installed at the 66kV step-up station around the project site, which has been confirmed to be in line with the Power Purchasing Agreement. The transmission losses of the 66 kV transmission line are

<sup>23</sup> <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1195741055.25/view>

<sup>24</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1218622278.09/view>

<sup>25</sup> <http://cdm.unfccc.int/Projects/Validation/DB/3YQQ1BZ8PGNK11YAB4UE9OCKZK0CWM/view.html>

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considered and it will be subtracted from the net electricity supplied to NECG for conservativeness as part of monitoring plan. A separate table has been provided by project participants in Section B.7.1 of the PDD Version 02.7 dated on 27<sup>th</sup> November 2009/1/. The validation team has checked the process of monitoring the line losses between the step-up station and the substation. The line losses of the project activity will be calculated considering the readings of the gateway meter installed at the 66kV step-up station, the backup meters installed at the substation, and the gateway meters of other windfarms which have been connected with and delivered the electricity to NECG through the same transmission line. Detailed calculation formulas have been provided in the Section B.7.1 of the revised PDD and the validation team confirms the monitoring of the line losses is thus feasible in the context of the project activity.

The measurement will be hourly carried out and monthly recorded and the data will be monitored and electronic archived. The data will be cross-checked against the sales receipts from the grid company.

#### 4.6.3 Management system and quality assurance

The implementation of the Monitoring Plan stated in Section B.7.2 of the PDD. The monitoring plan of the proposed project includes the followings:

- 1). Key data to be monitored
- 2). Metering system
- 3). Data collection and reporting
- 4). Calibration and accident treatment of meter and metering
- 5). The operational and management structure for monitoring
- 6). Data management system
- 7). Verification

The management system and quality assurance has been sufficiently identified in the PDD. The project owner will set up a CDM Monitoring Office and designate a qualified staff responsible for all relevant matters including monitoring, data collection and archiving, QC/QA, and verification. The management structure for monitoring has been clearly described in the PDD and the responsibilities of Office Manager, Audit Section and Monitoring Section have been clearly identified.

The management team, technical staff, operation and maintenance staff will receive periodic training from CDM development center of CPCEC, which can ensure all involved staff is competent for operation of the monitoring system. The training program/28/ has been reviewed by validation team and is completely and appropriately documented. More detailed training procedure and records will be available to DOE at verification stage.

The QA/QC and data management procedures are also suitably described in the PDD. Detailed procedures have been developed and the implementation of these will enable subsequent verification of the project's emission reductions. The data monitored and required for verification and issuance are to be kept for two years after the end of the crediting period or the last issuance of CERs for this proposed project activity, whatever occurs later.

**Therefore, the validation team is able to confirm that the project participant is competent to implement the monitoring plan under the context of the project activity.**

## 4.7 Estimate of GHG Emissions

Since the project activity utilizes wind power for electricity generation, no auxiliary fuels will be used and it is verified by the validation team during the on-site inspection. The auxiliary electricity consumption only comes from the grid and will be excluded during baseline emission calculation. Therefore, the project emission is thus determined as zero according to ACM0002. (PEy=0).

According to ACM0002, potential emission arising from power plant construction, fuel handling and inundation do not need to be considered as leakage. Therefore, no leakage needs to be considered for the project activity (Ly=0).

The baseline emission factor for the project, using the combined margin (CM) approach, is fixed *ex-ante* during the first 7-year crediting period according. The default weights for the proposed project of 75% OM and 25% BM have been selected according to Tool to calculate the emission factor for an electricity system (version 01.1)/5/. For the calculation of OM emission factor, simple OM emission factor calculation method is chosen because low cost/must run projects constitute less than 50% of the total grid generation and data is not available for applying the dispatch data analysis. The average emission factor for the grid for each fuel type is calculated *ex-ante* based on a 3-year full generation-weighted average of the data available from 2004-2006 derived from *China Electric Power Yearbook* and *China Energy Statistics Yearbook 2005-2007/11//12/*, which are the most recent information at the time of submission for validation. Because plant specific fuel consumption and electricity generation data is not publicly available in China, a deviation of the baseline methodology of AM0005 (later replaced by ACM0002) approved by the EB (as detailed in the PDD) is adopted for using relevant emission data recently published by the DNA of P.R. China on 18<sup>th</sup> July 2008/38/. According to the revised PDD, the OM emission factor of NCEG is calculated as 1.2561 tCO<sub>2</sub>e/WWh and the BM emission factor of NCEG is calculated as 0.7946 tCO<sub>2</sub>e/WWh. The combined margin (CM) of NCEG is thus calculated as 1.1408 tCO<sub>2</sub>e/WWh. By considering the annual on-grid output of 110,458MWh generated from the project activity, the emission reductions, which equals to the baseline emissions, are thus calculated as 126,010 tCO<sub>2</sub>e per year. The OM and BM calculation spread sheet was checked by the validation team and the data preciseness was confirmed to be in line with the revised PDD.

In summary, the GHG emissions calculations are transparently documented and appropriate assumptions regarding expected amount of electricity generated have been used to forecast emission reductions. A conservative approach has been adopted in both the prediction of baseline emissions and project emissions.

All assumptions made for estimating GHG are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
All data used by project participants are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Their references and sources are also listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Formulas, parameters, values are complete, accurate, transparent and conservative	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
All the references and documents used are correctly quoted and conservatively	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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<i>interpreted in the PDD</i>		
<i>Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>All the emissions of baseline emissions can be replicated using information provided in the PDD</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

## 4.8 Sustainable Development

The host party's DNA, National Development and Reform Commission has confirmed the contribution of the project to the sustainable development in China according to the Letter of Approval for the Project/43/, which was checked by the validation team to be valid.

## 4.9 Environmental Impacts

The environmental impact assessment (EIA)/7/ for this project was carried out by the Liaoning Research Academy of Environmental Sciences in December 2006. The EIA report has been approved by the Liaoning Environmental Protection Bureau on 30<sup>th</sup> March 2007.

The conclusion of the report has been described in the PDD. According to the environmental impact assessment required by the host country, China, it can be verified that the impacts are not considered significant. The expropriated land has been properly compensated according to local governmental policy. The Land Compensation Agreements/60/ have been checked to be valid.

In addition, no significant environmental impacts were identified during the on site assessment. This is further confirmed by the Head of local Environmental Protection Bureau during onsite visit. No environmental complaint was received since the project commences its construction.

## 4.10 Comments by Local Stakeholders

Local stakeholders were invited through a questionnaire/30/ to provide comments on the project. In the survey, 67 questionnaires were distributed to local stakeholders and 67 questionnaires were returned giving a 100% responding rate. TÜV Rheinland has reviewed all the questionnaires received. The local stakeholders, including government official of Beita County, local institution (agricultural bureau, water resources station) and local villagers, are adequately invited.

The survey shows that the proposed project receives support from the local people. The processes by which comments from local stakeholders have been invited and compiled, has been described within Section E of the PDD. Furthermore, during the on site visit, representatives from the local community were interviewed. In general, the interviewees show adequate understanding of the nature of the project and agreed that the project would benefit the environment, society and economic development. The response is overall supportive.

## 4.11 Comments by Parties, Stakeholders and NGOs

The PDD of “20<sup>th</sup> January 2008 version 1” was made publicly available on TÜV Rheinland’s website([http://www.tuvdotcom.com/pi/web/TuvdotcomIdSearchResults.xml?option=tested\\_products\\_by\\_tuvdotcomid&LanguageChanged=en-us&TUVdotCOMID=9105045057](http://www.tuvdotcom.com/pi/web/TuvdotcomIdSearchResults.xml?option=tested_products_by_tuvdotcomid&LanguageChanged=en-us&TUVdotCOMID=9105045057)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from “6<sup>th</sup> February 2008” to “6<sup>th</sup> March 2008”, where no comment was received and is given in this period.

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APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
<b>About Parties</b>		
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
The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	<del>CAR01</del>
The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	<del>CAR01</del>
In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
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
<b>About additionality</b>		
Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	<del>CAR07</del>

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

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Requirement	Reference	Conclusion
anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.		<del>CAR08</del> <del>CAR09</del> <del>CL04</del> <del>CL05</del> <del>CL06</del> <del>CL07</del> <del>CL08</del>
<b>About forecast emission reductions and environmental impacts</b>		
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
<b>For large-scale projects only</b>		
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
<b>About stakeholder involvement</b>		
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
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
<b>Other</b>		
The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK

Requirement	Reference	Conclusion
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
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
The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
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**

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1 Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1 Are the project's spatial boundaries (geographical) clearly defined?	/1/ /3/ /8/	DR	Yes. The project is located at Xiaodianzi Village, Beita County, Beipiao City, Liaoning Province. The geographical coordinates are <a href="#">120.8656°-120.9258°E, 42.2192°-42.2609°N</a> .  <b>CL01</b> The project proponents are requested to clearly describe the windfarm boundary with a more precise map or geographical coordinates that could be clearly identified.	<del>CL01</del>	OK (Refer to Table 3)
A.1.2 Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/ /3/ /15/	DR	Yes. The electricity generated by the project will be delivered to Northeast China Grid (NECG) through Liaoning provincial grid. The NECG is defined as the project's system boundary.  <b>CL03</b> The project proponents are requested to present in Section B.3 a flow diagram of the project boundary, physically delineating the project activity, based on the descriptions provided in section A.4.3.	<del>CL03</del>	OK (Refer to Table 3)

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CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
<b>A.2 Participation Requirements</b> <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>						
A.2.1 Which Parties and project participants are participating in the project?	/1/ /9/ /43/	DR	The host party is People’s Republic of China, and project participant from Host Country is: Zhongdiantou Northeast New Energies Development Co., Ltd. The Annex I country is Germany, and project participant from Annex I country is KfW. <b>CAR02</b> Page 2, A.3, the project participant name from China is Zhongdiantou Northeast New Energies Co., Ltd. which is not consistent with the participant name on Page 29, Annex 1. Please correct the project participant name as per the business licence and keep it consistent.	<del>CAR02</del>	OK (Refer to Table 3)	
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/ /43/	DR	The Letters of Approval from China DNA and German DNA have been received. <b>CAR01</b> The Letters of Approval from Host Party China and the participating Annex I Party Germany are not received yet.	<del>CAR01</del>	OK (Refer to Table 3)	
A.2.3 Do all participating Parties fulfil the participation	/1/	DR	Yes.	OK	OK	

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority		/43/		-China has ratified the Kyoto Protocol on 30 <sup>th</sup> , August, 2002. -Germany has ratified the Kyoto Protocol on 31 May 2002. DNA of China is National Development and Reform Commission; DNA of Germany is Umweltbundesamt - Deutsche Emissionshandelsstelle.		
A.2.4 Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.		/1/ /17/ /18/	DR I	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.	OK	OK
<b>A.3 Technology to be employed</b> <i>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.</i>						
A.3.1 Does the project design engineering reflect current good practices?		/1/ /8/ /22/	DR	Yes. The technology was domestic produced and reflect current good practice.	OK	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/ /8/ /22/	DR I	Yes. 33 wind turbines with Model No. S77-1500 will be installed for the project activity, and the manufacturer is Xinjiang Goldwind Science and Technology Co., Ltd. which is domestic technology provider.	CAR03	OK (Refer to Table 3)

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				<b>CAR03</b> Please recheck the technical specifications with the equipment purchasing contract, and the main technical parameters of the wind turbine and generator should be provided in Table A-1, on Page 4 in the PDD.		
A.3.3 Does the project make provisions for meeting training and maintenance needs?		/1/ /28/	DR I	Yes. The project owner will establish a CDM Monitoring Office and the CDM office manager will manage the process of training staff. All staff involved in the CDM projects will receive some periodic training to collect and archive monitoring data.	OK	OK
<b>A.4 Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>						
A.4.1 Has the host country confirmed that the project assists it in achieving sustainable development?		/1/ /7/ /43/	DR	The LoA from host country has been received and China DNA has confirmed the project assists in achieving sustainable development.	<del>CAR01</del>	OK (Refer to Table 3)
A.4.2 Will the project create other environmental or social benefits than GHG emission reductions?		/1/ /7/ /8/	DR I	Yes. The Project will produce positive environmental impacts and economic benefits and contribute to the local sustainable development, especially on the alleviation of power shortage in the local areas, creating new job opportunities for the local people.	OK	OK
<b>B. Project Baseline</b>						

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Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.	
		<i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>			
		<b>B.1 Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>			
B.1.1 Does the project apply an approved methodology and the correct version thereof?	/1/ /3/ /38/	DR  The project applies the approved baseline methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generations from renewable sources” Version 07.  <b>CAR04</b> The title of ACM0002 Version 7 should be revised as per the publishing methodology on UNFCCC website.	<del>CAR04</del>	OK (Refer to Table 3)	
B.1.2 Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /3/ /15/ /38/	DR I Yes. The baseline methodology is applicable because the project activity is a new grid-connected windfarm project. The applicability for ACM0002 is justified as follows: - The project is a new wind farm plant to supply the electricity capacity additions; - The project does not involve switching from fossil fuels to a renewable energy source at the proposed site; - The geographic and system boundaries for the electricity grid (NECG) to which the proposed	OK	OK	

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			project will be connected can be clearly identified and information on the characteristics of the grid is available.		
<b>B.2 Baseline Scenario Determination</b> <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1 What is the baseline scenario?	/1/ /3/ /5/	DR	The baseline scenario is justified as the 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 within Northeast China Grid, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system” version 01.1.	OK	OK
B.2.2 What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /3/	DR I	Since the project is a new wind-farm project, no other alternative scenarios needs to be considered according to ACM0002 Version 07. <b>CAR05</b> The project proponents are requested to justify the baseline scenario according to the applied methodology ACM0002 Version 07.	<del>CAR05</del>	OK (Refer to Table 3)
B.2.3 Has the baseline scenario been determined according to the methodology?	/1/ /3/	DR	Yes, the baseline scenario has been determined according to ACM0002 Version 07	OK	OK

CHECKLIST QUESTION * 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/ /3/	DR	<b>CAR06</b> The project proponents are requested to update the OM and BM emission factors according to the most recent data available at the time of PDD submission for validation.	<del>CAR06</del>	OK (Refer to Table 3)
B.2.5 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /3/ /38/	DR I	Yes. The renewable energy policy, power industry development of NECG and other relevant national policy have been considered.	OK	OK
B.2.6 Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /15/	DR I	Yes. The baseline scenario determination is compatible with the available data.	OK	OK
B.2.7 Have the major risks to the baseline been identified?	/1/	DR	There are no major risks to the baseline scenario.	OK	OK
<b>B.3 Additionality Determination</b> <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1 Is the project additionality assessed according to the methodology?	/1/ /3/ /4/	DR	Yes. “Tool for demonstration and assessment of additionality” Version 05.2 is applied as per the methodology and is the latest.	OK	OK
B.3.2 Are all assumptions stated in a transparent and conservative manner?	/1/ /3/	DR	Yes. All assumptions are stated in a transparent and conservative manner.	OK	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
		/4/				
B.3.3 Is sufficient evidence provided to support the relevance of the arguments made?		/1/	DR I	<b>CAR08</b>	<del>CAR08</del>	OK (Refer to Table 3)
		/4/		All basic parameters, including equity ratio, annual O&M cost and interest rate, etc, shall be provided on Page 8. Moreover, a basic parameters sheet shall be involved in the IRR spread sheet in a transparent manner.	<del>CAR09</del>	
		/11/			<del>CL04</del>	
		/13/			<del>CL05</del>	
		/14/			<del>CL06</del>	
		/15/			<del>CL07</del>	
		/16/		<b>CAR09</b>	<del>CL08</del>	
		/27/		The installed capacity of Liaoning Xianrendao is indicated as 32.60 MW in Table B-4 which is not consistent with what indicated in Sub-step 4b.		
		/32/~				
		/39/				
		/41/				
		/42/		<b>CL04</b>		
		/49/~		The project proponents are requested to further clarify with supporting information on how to justify the alternative with respect to “construction of a power plant using other renewable energy”.		
		/59/				
		/61/				
		/62/				
		/63/				
				<b>CL05</b>		
				The project proponent is required to give clarifications in the PDD on how to justify the benchmark as 8% on Page 8 “Sub-step 2b. Option III. Apply benchmark Analysis”.		
				<b>CL06</b>		
				The bus-bar tariff was estimated as 0.501 RMB/kWh in the investment analysis for the project activity. However, according to the		

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* MoV = Means of Verification, DR= Document Review, I= Interview				<p>latest bus-bar tariff approval for windfarm projects within Liaoning Province by NDRC, the bus-bar tariff shall be 0.61 RMB/kWh (VAT Included) for the first 30,000 full-load equivalent operational hours and the bus-bar tariff after namely 30,000 hours shall be executed according to the average tariff level, which will be approved by National Development and Reform Commission. The project proponents are requested to clarify for such inconsistency and the impact on project IRR should be substantiated.</p> <p><b>CL07</b> The project proponents are requested to clarify why the total static investment is not likely to reduce significantly during sensitivity analysis. Existed explanation is not plausible since the static investment does not include the tax rate and the project IRR is adopted for investment analysis, on which interest rate has no impact.</p> <p><b>CL08</b> The windfarm projects listed in the PDD are not complete in Liaoning Province through comparison with China Windfarm Installed Capacity Statistics in 2007, which was checked by the Validation Team on the official website of National Windpower Engineering Technology Research Center. Furthermore, the project proponents are requested to justify the</p>		

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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/ /15/ /19/ /20/ /21/ /22/	DR I	<p>essential distinctions between the proposed project and other similar windfarm projects in Liaoning Province.</p> <p>The expected CDM revenue has been considered to overcome the investment barriers for the project activity at the beginning of the project design according to the Project FSR issued in July 2007. The CDM buyer bidding for the Project was arranged in July 2007. The incentive of CDM was essential for the project owner to proceed with the project investment.</p> <p><b>CAR07</b> Following the latest Guidance for Completing the Project Design Document (Annex12/EB41), the project proponents shall clearly demonstrate in Section B.5 regarding the implementation timeline of the proposed CDM project activity with documented evidence (e.g. construction starting permission letter, main equipment contract and board meeting minutes et. al). Moreover, the project proponents shall also clearly demonstrate timeline of events and actions which have been taken to achieve CDM registration, with descriptions of the evidence used to support these actions.</p>	CAR07	OK
<b>B.4 Calculation of GHG Emission Reductions – Project emissions</b> <i>It is assessed whether the project emissions are stated</i>					

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* MoV = Means of Verification, DR= Document Review, I= Interview						
<i>according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.4.1 Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/	DR	Yes. The project emission is determined as zero for wind power project as per ACM0002.	OK	OK	
B.4.2 Have conservative assumptions been used when calculating the project emissions?	/1/ /3/	DR	Yes.	OK	OK	
B.4.3 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	No major uncertainties are addressed when estimating project emission in the PDD.	OK	OK	
<b>B.5 Calculation of GHG Emission Reductions – Baseline emissions</b>  <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.5.1 Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/ /5/ /11/ /12/ /15/ /16/ /38/	DR	Yes. The baseline emission factor for the project is determined ex-ante as a combined margin emission factor, which is combination of operating margin and build margin for NECG. The calculations comply with ACM0002 and relative information available including IPCC Guideline, China Electric Power Yearbook 1999~2007, and China Energy Statistical Yearbook 2004~2007, etc.	OK	OK	

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.5.2 Have conservative assumptions been used when calculating the baseline emissions?		/1/ /16/ /38/	DR	The baseline emissions have been calculated according to the most recent information of Chinese grid baseline emission factors published by China DNA on 18 <sup>th</sup> July 2008.  <b>CAR10</b> The baseline emissions for the Project shall be revised with the updated OM and BM emission factors, which are calculated according to the most recent data available at the time of PDD submission for validation.	<del>CAR10</del>	OK (Refer to Table 3)
B.5.3 Are uncertainties in the baseline emission estimates properly addressed?		/1/	DR	No significant uncertainties have been addressed when estimating baseline emissions in the PDD.	OK	OK
<b>B.6 Calculation of GHG Emission Reductions – Leakage</b> <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.6.1 Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?		/1/ /3/	DR	No leakage needs to be considered for wind power project as per ACM0002.	OK	OK
B.6.2 Have conservative assumptions been used when calculating the leakage emissions?		/1/ /3/	DR	Yes.	OK	OK



CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.6.3 Are uncertainties in the leakage emission estimates properly addressed?		/1/	DR	No significant uncertainties have been addressed when estimating leakage emissions in the PDD.	OK	OK
<b>B.7 Emission Reductions</b> <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>						
B.7.1 Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.		/1/ /3/	DR	Yes. The emission reduction is real, measurable and give long-term benefits related to the mitigation of climate change	OK	OK
<b>B.8 Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>						
B.8.1 Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?		/1/ /3/ /5/	DR	Yes.		
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/ /3/	DR	Yes. As mentioned in PDD, the data monitored and required for verification and issuance are to be kept for two years after the end of the crediting period or the last issuance of CERs for this proposed project activity, whatever occurs later.	OK	OK
<b>B.9 Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>reliable and complete project emission data over time.</i>						
B.9.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?		/1/ /3/	DR I	Yes. The project emission is determined as zero for wind power project as per ACM0002.	OK	OK
<b>B.10 Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>						
B.10.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?		/1/ /3/ /38/	DR I	Yes. The project uses the ex-ante determination approach to calculate the OM and BM emission factors. The electricity imported and exported is measured by the main meter (i.e. gateway meter) installed at the 66kV step-up station around the project site, which has been confirmed to be in line with the Power Purchasing Agreement. The transmission losses of the 66 kV transmission line are considered and it will be subtracted from the net electricity supplied to NECG for conservative during verification.	OK	OK
B.10.2 Are the choices of baseline GHG indicators reasonable and conservative?		/1/	DR	Yes.	OK	OK
B.10.3 Is the measurement <i>method</i> clearly stated for each baseline indicator to be monitored and also deemed appropriate?		/1/ /3/ /8/	DR	Yes The electricity imported and exported is measured by the main meter (i.e. gateway meter) installed at the 66kV step-up station around the project site, which has been	OK	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			confirmed to be in line with the Power Purchasing Agreement. The transmission losses of the 66 kV transmission line are considered and it will be subtracted from the net electricity supplied to NECG for conservative during verification.		
B.10.4 Is the measurement <i>equipment</i> described and deemed appropriate?	/1/ /3/ /8/	DR I	Yes.	OK	OK
B.10.5 Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	Yes. The measurement accuracy of the electrical meter is 0.2 S. The procedure to deal with erroneous measurement is identified in the PDD.	OK	OK
B.10.6 Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR I	Yes. The electricity supplied to NECG will be hourly measured and monthly recorded.	OK	OK
B.10.7 Is the <i>registration, monitoring, measurement</i> and <i>reporting</i> procedure defined?	/1/	DR I	Yes. The procedure for registration, monitoring, measurement and reporting are identified in the monitoring plan.	OK	OK
B.10.8 Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	Yes. The monitoring equipment and installations are maintained by qualified organisation according to relevant national standard and regulations, and all installed metering equipment are calibrated and checked periodically.	OK	OK

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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. The procedures for day-to-day records handling are identified in the monitoring plan in the PDD.	OK	OK
<b>B.11 Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>						
B.11.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?		/1/ /3/	DR	No leakage needs to be considered for wind power project as per ACM0002.	OK	OK
B.11.2 Are the choices of project leakage indicators reasonable and conservative?		/1/ /3/	DR	Idem.	OK	OK
B.11.3 Is the measurement <i>method</i> clearly stated for each leakage value to be monitored and deemed appropriate?		/1/ /3/	DR	Idem.	OK	OK
<b>B.12 Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>						
B.12.1 Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?		/1/ /7/	DR	Neither ACM0002 nor the Chinese DNA requires the collection and archiving of relevant data concerning environmental, social and economic impacts. However the environmental impacts will be monitored by local environmental authority.	OK	OK
B.12.2 Does the monitoring plan provide for the collection and		/1/	DR	Idem.	OK	OK

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
archiving of relevant data concerning environmental, social and economic impacts?	/3/ /7/				
B.12.3 Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Idem.	OK	OK
<b>B.13 Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1 Is the authority and responsibility of overall project management clearly described?	/1/ /23/	DR I	Yes. The authority and responsibility of project management is clearly described in the PDD.	OK	OK
B.13.2 Are procedures identified for training of monitoring personnel?	/1/	DR I	Yes. The monitoring personnel will receive some periodic training for CDM monitoring from CPCEC CDM Development Centre. A training program has been compiled by the project owner. The CDM office manager will ensure that only trained staff is involved in the operation of the monitoring system.	OK	OK
B.13.3 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	No emergency situations which can cause unintended emissions are foreseen from the project.	OK	OK
B.13.4 Are procedures identified for review of reported results/data?	/1/	DR	Yes. The procedures for review of reported results/data have been identified in the monitoring plan.	OK	OK
B.13.5 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Yes. Detailed procedures will be in place and maintained and implemented at the latest prior to the start of the crediting period to	OK	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				enable subsequent verification of emission reductions		
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>						
C.1 Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/ /3/ /21/	DR		Yes. The starting date of the project construction is 20 <sup>th</sup> , September, 2007, and the lifetime of the project is expected to be 20 years.	OK	OK
C.2 Is the start of the crediting period clearly defined and reasonable?	/1/	DR I		Yes. Renewable crediting period of 7 years is selected and the starting date of the first crediting period is 1 <sup>st</sup> , September 2009 or the date of registered, whichever is later. <b>CL02</b> The starting date of the crediting period is selected as 1 <sup>st</sup> August 2008 which is unrealistic and needs to be updated.	<del>CL02</del>	OK (Refer to Table 3)
<b>D. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>						
D.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /7/	DR		Yes. The EIA was carried out by Liaoning Academy of Environmental Sciences in December 2006, and the impacts were identified in the EIA report. The mitigation measures will be performed to alleviate the impact of construction and operation of the	OK	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				project activity on local residents and ecosystems.		
D.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /7/	DR		Yes. The EIA report has been approved by Liaoning Environmental Protection Administration in March, 2007.	OK	OK
D.3 Will the project create any adverse environmental effects?	/1/ /7/ /60/	DR		Environmental impacts have been addressed in the EIA report. The negative impacts will be alleviated through mitigation measures which were suggested in the EIA report. No significant adverse environmental effects are expected from the project activity.	OK	OK
D.4 Are transboundary environmental impacts considered in the analysis?	/1/ /7/	DR		No transboundary environmental impacts are foreseen in the project activity.	OK	OK
D.5 Have identified environmental impacts been addressed in the project design?	/1/ /7/	DR		Yes. The EIA has been carried out and the environmental impacts have been identified in Section D in the PDD.	OK	OK
D.6 Does the project comply with environmental legislation in the host country?	/1/ /7/	DR		Yes. The EIA report was approved by Liaoning Environmental Protection Administration.	OK	OK
<b>E. Stakeholder Comments</b> <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>						

<b>CHECKLIST QUESTION</b>					
* MoV = Means of Verification, DR= Document Review, I= Interview					
	<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
E.1 Have relevant stakeholders been consulted?	/1/ /7/ /46/	DR I	Yes. The project owner completed a specific investigation on stakeholder comments in the form of questionnaires, newspaper and notification.	OK	OK
E.2 Have appropriate media been used to invite comments by local stakeholders?	/1/ /46/	DR I	Idem.	OK	OK
E.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/ /24/ /46/	DR I	Yes. The stakeholder consultation process is carried out in accordance Chinese EIA regulations.	OK	OK
E.4 Is a summary of the stakeholder comments received provided?	/1/ /46/	DR	Yes. The summary of stakeholder comments received is described in the PDD.	OK	OK
E.5 Has due account been taken of any stakeholder comments received?	/1/ /7/ /24/	DR	All stakeholder comments are supportive to the project activity, and no objections are received during investigation.	OK	OK

Table 3 Resolution of Corrective Action and Clarification Requests

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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
<b>CAR01</b> The Letters of Approval from Host Party China and the participating Annex I Party Germany are not received yet.	A.2.2 A.2.3 A.4.1	The Letters of Approval from China DNA and German DNA have been received and provided to DOE.	The LoA from China DNA and German DNA have been received and checked by the validation team to be valid. See details in Section 4.1.  CAR01 is therefore closed.
<b>CAR02</b> Page 2, A.3, the project participant name from China is Zhongdiantou Northeast New Energies Co., Ltd. which is not consistent with the participant name on Page 29, Annex 1. Please correct the project participant name as per the business licence and keep it consistent.	A.2.1	The project participant name from China is Zhongdiantou Northeast New Energies Development Co., Ltd. And it keeps consistent in PDD.	OK. The project participant name has been checked to be consistent with the business licence of the project owner. Furthermore, the contact information of the project participants is confirmed to be in line with the Modalities of Communication.  The CAR is therefore closed.
<b>CAR03</b> Please recheck the technical specifications with the equipment purchasing contract, and the main technical parameters of the wind turbine and generator should be provided in Table A-1, on Page 4 in the PDD.	A.3.2	The technical specifications have been revised and were consistent with the equipment purchasing contract and provided in table A-1 in the PDD.	OK. 33 units of Xinjiang Goldwind 77/1500 wind turbines are adopted for the project activity. The key technical specifications are listed in the Table A-1 in the revised PDD and are confirmed to be in line with the Equipment Purchasing Contract.  The CAR is therefore 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
<b>CAR04</b> The title of ACM0002 Version 7 should be revised as per the publishing methodology on UNFCCC website.	B.1.1	The title of ACM0002 Version 7 has been revised in the PDD.	OK. The title of ACM0002 Version 7 has been revised.  The CAR is therefore closed.
<b>CAR05</b> The project proponents are requested to justify the baseline scenario according to the applied methodology ACM0002 Version 07.	B.2.2	The baseline scenario has been revised according to the methodology ACM0002 (Version 07) in PDD.	OK. Since the Project is a new wind power plant providing electricity addition to Northeast China Grid, the baseline scenario is justified as the 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. The baseline identification in the revised PDD is conducted in accordance with ACM0002 Version 07.  The CAR is therefore closed.
<b>CAR06</b> The project proponents are requested to update the OM and BM emission factors according to the most recent data available at the time of PDD submission for validation.	B.2.4	The emission factors have been updated according to the most recent data.	OK. The OM and BM emission factor is ex-ante determined based on the information derived from China Energy Statistical Yearbooks 2004~2007 and China Power

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
			<p>Electric Power Yearbooks 1999~2007, which was confirmed to be the most recent information at the time of submission for validation. The OM and BM calculations are conducted in accordance with the latest Guidance on Determination of OM and BM Emission Factor of Chinese Power Grid has been published by China DNA on 18<sup>th</sup> July 2008.</p> <p>The CAR is therefore closed.</p>
<p><b>CAR07</b> Following the latest Guidance for Completing the Project Design Document (Annex12/EB41), the project proponents shall clearly demonstrate in Section B.5 regarding the implementation timeline of the proposed CDM project activity with documented evidence (e.g. construction starting permission letter, main equipment contract and board meeting minutes et. al). Moreover, the project proponents shall also clearly demonstrate timeline of events and actions which have been taken to achieve CDM registration, with descriptions of the evidence used to support these actions.</p>	B.3.3	<p>The implementation timeline of the proposed project has been provided in Section B.5 in PDD, including the construction starting date, the date of signing main equipment contract, and the date of considering seriously about develop the proposed project as CDM project. Related evidence is available for DOE.</p>	<p>OK.</p> <p>The project implementation history has been clearly demonstrated in the revised PDD. The key events have been listed with respect to the accomplishment of FSR design, project approval, construction starting and equipment procurement. The CDM development timeline has also clearly been identified with respect to the prior CDM consideration, CER buyer tendering, ERPA negotiation, validation process and LoA approval.</p> <p>The starting date of the project activity was justified according to the project implementation timeline. The construction starting date “20<sup>th</sup> September 2007” was</p>

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
			<p>confirmed to be the earliest date representing the real action begins. The CDM incentive was seriously considered in the FSR in July 2007 and the international CER buyer tendering in July 2007.</p> <p>The CAR is therefore closed.</p>
<p><b>CAR08</b> All basic parameters, including equity ratio, annual O&amp;M cost and interest rate, etc, shall be provided on Page 8. Moreover, a basic parameters sheet shall be involved in the IRR spread sheet in a transparent manner.</p>	B.3.3	<p>Equity ratio, average annual O&amp;M cost and long-term interest rate have been provided in PDD.</p> <p>The basic parameters sheet has been involved in the IRR spread sheet and available for DOE.</p>	<p>OK.</p> <p>The basic parameters have been added in the Table B-3 and the data source was clearly identified in the revised PDD. A basic parameters sheet has been added in the revised IRR spread sheet. The basic parameters have been confirmed to be consistent in the revised PDD and IRR spread sheet.</p> <p>The CAR is therefore closed.</p>
<p><b>CAR09</b> The installed capacity of Liaoning Xianrendao is indicated as 32.60 MW in Table B-4 which is not consistent with what indicated in Sub-step 4b.</p>	B.3.3	<p>The installed capacity of Liaoning Xianrendao has been corrected in sub-step 4b.</p>	<p>OK.</p> <p>The installed capacity of Liaoning Xianrendao has been revised as 32.60MW and was confirmed to be consistent.</p> <p>The CAR is therefore closed.</p>

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
<b>CAR10</b> The baseline emissions for the Project shall be revised with the updated OM and BM emission factors, which are calculated according to the most recent data available at the time of PDD submission for validation.	B.5.2	The baseline emissions have been updated according to the most recent data in PDD.	OK. The OM emission factor is calculated <i>ex-ante</i> based on a 3-year full generation-weighted average of the data available from 2004-2006 derived from China Electric Power Yearbook and China Energy Statistics Yearbook 2005-2007, which are the most recent information at the time of submission for validation. Because plant specific fuel consumption and electricity generation data is not publicly available in China, a deviation of the baseline methodology of AM0005 (later replaced by ACM0002) approved by the EB (as detailed in the PDD) is adopted for using relevant emission data recently published by the DNA of P.R. China on 18 <sup>th</sup> July 2008. According to the revised PDD, the OM emission factor of NECG is calculated as 1.2561 tCO <sub>2</sub> e/WMh and the BM emission factor of NECG is calculated as 0.7946 tCO <sub>2</sub> e/WMh. The combined margin (CM) of NECG is thus calculated as 1.1408 tCO <sub>2</sub> e/WMh. By considering the annual on-grid output of 110.458MWh generated from the project activity, the emission reductions, which equals to the baseline emissions, are thus calculated as 126,010 tCO <sub>2</sub> e per year. The OM and BM calculation spread sheet

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
			<p>was checked by the validation team and the data preciseness was confirmed to be in line with the revised PDD.</p> <p>The CAR is therefore closed.</p>
<b>CL01</b> The project proponents are requested to clearly describe the windfarm boundary with a more precise map or geographical coordinates that could be clearly identified.	A.1.1	The windfarm boundary has been described with the geographical coordinates in A.4.1.4 of the PDD.	<p>OK.</p> <p>The coordinates of the proposed project are revised as 120.8656°-120.9258°E , 42.2192°-42.2609°N, which was checked by the validation team to be valid.</p> <p>The CL is therefore closed.</p>
<b>CL02</b> The starting date of the crediting period is selected as 1 <sup>st</sup> August 2008 which is unrealistic and needs to be updated.	B.3.3	The starting date of the crediting period has been updated to 1 <sup>st</sup> September 2009 and will be updated according to the time of PDD submission for registration.	<p>OK.</p> <p>The starting date of the crediting period has been updated to 1<sup>st</sup> September 2009 in the revised PDD and will be updated according to the time of PDD submission for registration.</p> <p>The CL is therefore closed.</p>
<b>CL03</b> The project proponents are requested to present in	A.1.2	The flow diagram of the project boundary has been presented in Section B.3 of the	<p>OK.</p> <p>The flow diagram of the project boundary</p>

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
Section B.3 a flow diagram of the project boundary, physically delineating the project activity, based on the descriptions provided in section A.4.3.		PDD.	<p>has been incorporated to physically delineate the project activity in Section B.3 in the revised PDD. The electrical connection scheme and the metering system were clearly identified in the flow diagram.</p> <p>The CL is therefore closed.</p>
<p><b>CL04</b></p> <p>The project proponents are requested to further clarify with supporting information on how to justify the alternative with respect to “construction of a power plant using other renewable energy”.</p>	B.3.3	<p>Besides wind energy, solar PV, geothermal, biomass and hydro are the possible grid-connected renewable energy technologies. There exist no economically exploitable hydro resources with a commensurate scale to the project. In China, solar power plants and biomass power plants are still in the demonstration phase and limited by the cost. The project owner has no experience to develop solar power plants and biomass power plants. As for geothermal power plants, there are no available geothermal resources to generate electricity at the project site. Therefore, these kinds of power plants cannot provide the equivalent amount of annual electricity generation as the proposed project. Therefore, the alternative with respect to “construction of a power plant using other renewable energy” is not feasibility.</p> <p>New evidence has been provided in the</p>	<p>OK.</p> <p>The supporting reference information in the revised PDD has been checked by the validation team and was deemed as credible evidence for exclusion of other renewable energy alternative. Moreover, the feasibility of other renewable power plant has been cross-checked through site interview with the Mr. Wang Xuewei/iii/ (Official from Development and Reform Commission of Beipiao City), who has confirmed other renewable power plants were not financial attractive in local area. There is not economically viable hydro resources and geothermal source around the project site. The nearby Baishui Reservoir was mainly used for municipal water supply according to Mr. Wang Xuewei/iii/. The solar energy with similar installed capacity is not economically attractive since the generation cost is much higher than other kinds of</p>

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
		Section B.5. of PDD and is available for DOE.	<p>power plant. Most of the biomass including maize and straw is utilized for cooking in local area according Mr. Wang Xuewei/iii/, and the biomass plant is not financial attractive either. Furthermore, the project owner is a new company which is dedicated to windfarm projects development in Northeast China. The project owner had no experiences and ability to develop biomass power plant.</p> <p>Therefore, alternative c) is not feasible and credible alternative for the project activity.</p> <p>The CL is therefore closed.</p>
<p><b>CL05</b> The project proponent is required to give clarifications in the PDD on how to justify the benchmark as 8% on Page 8 “Sub-step 2b. Option III. Apply benchmark Analysis”.</p>	B.3.3	The benchmark as 8% (after tax) on Page 8 “Sub-step 2b is according to the <i>Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects</i> compiled by State Power Corporation of China.	<p>OK.</p> <p>The validation team has reviewed the source of the 8% benchmark - <i>Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects/13/</i>, which is deemed an appropriate benchmark reference for the retrofit power projects and new power projects investment in China. Furthermore, it has been commonly adopted for financial evaluation for the registered wind power CDM projects in China. The validation team could therefore confirm the benchmark IRR was suitably</p>



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
			adopted.  The CL is therefore closed.
<b>CL06</b> The bus-bar tariff was estimated as 0.501 RMB/kWh(VAT Excluded) in the investment analysis for the project activity. However, according to the latest bus-bar tariff approval for windfarm projects within Liaoning Province by NDRC, the bus-bar tariff shall be 0.61 RMB/kWh (VAT Included) for the first 30,000 full-load equivalent operational hours and the bus-bar tariff after namely 30,000 hours shall be executed according to the average tariff level, which will be approved by National Development and Reform Commission. The project proponents are requested to clarify for such inconsistency and the impact on project IRR should be substantiated.	B.3.3	The tariff of the wind farms in Liaoning Province is made by the National Development and Reform Commission (NDRC). The tariff of wind farms in Liaoning Province is downtrend and not fixed before 2007. From 2003 to 2006, China's NDRC organized four activities to make the tariff of the wind farms through public bidding. Besides the tariff of one wind farm in Shandong Province is 0.6 RMB/kWh (Incl.VAT) because of the more farmland, different from the proposed project, 0.501 RMB/kWh (Excl.VAT), equal to 0.544 RMB/kWh (Incl.VAT), used in FSR is higher than the highest tariff (0.519 RMB/kWh (Incl.VAT)) of the four activities. So, the FSR by Liaoning Electrical Power Survey & Design Institute adopts the tariff with 0.501 RMB/kWh in the 20-year investment analysis. The tariff of the proposed project will be approved by the NDRC before starting operation. But from 2007 to the first half year of 2008, the tariff of the new similar scale wind farms as the proposed project in Liaoning Province	OK. The validation team has reviewed the <i>Chinese Renewable Energy Law issued by Chinese Government/33/</i> (effective since 1 <sup>st</sup> June 2006) and <i>Provisional Administrative Measures on Pricing and Cost Sharing for Renewable Energy Power Generation/32/</i> issued by Chinese Development and Reform Commission on 4 <sup>th</sup> January 2006. According to the governmental policy for wind power projects, the bus-bar tariff for new wind power plant shall follow the government's directive tariff, which is determined by Price Administration Department of State Council (i.e. National Development and Reform Commission) based on the bidding tariff. It has been explained that the bus-bar tariff in the FSR was estimated according to the bidding tariff level for Windfarm Concession Projects in China at the time of FSR design. Four Windfarm Concession Projects Bidding activities have been arranged during the year 2003~2006. The evidence with respect to the final bidding

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
		<p>approved by China's NDRC keeps the same. Namely, the first 30,000 full-load equivalent operational hours adopt 0.61 RMB/kWh (Incl.VAT), and the other operational hours adopt the average tariff in the local area. The sensitivity analysis in the section B.5 of PDD also use 0.61 RMB/kWh (Incl.VAT) in the first 30,000 full-load equivalent operational hours and 0.3621 RMB/kWh (Incl.VAT) in the other operational hours to calculate the IRR of the proposed project for conservativeness. The IRR (after tax) is 7.18%, and could not reach the benchmark IRR (8%). RMB 0.3621/kWh (Incl.VAT) is the highest tariff of the coal-fired power plants in Liaoning Province. The evidence and the computation table have been provided to the DOE.</p>	<p>tariff of these 4 activities has been provided to the validation team. It has been confirmed by the validation team that the highest bidding tariff for other Concession Projects in 2006 was 0.5006 RMB/kWh (VAT Included), which was even lower than the estimated tariff 0.544 RMB/kWh (VAT Included) in the FSR. Therefore, it was conservative for the project proponents to adopt a higher tariff of 0.544 RMB/kWh (VAT Included) at the time of FSR design by considering the bidding tariff information which was public available. Furthermore, the validation team has also cross-checked with the latest bus-bar tariff approved by National Development and Reform Commission dated on 3<sup>rd</sup> December 2007 and 23<sup>rd</sup> July 2008/37/. For wind power projects within Liaoning Province, Heilongjiang Province and Jilin Province, the bus-bar tariff shall be 0.61 RMB/kWh (VAT Included) for the first 30,000 full-load equivalent operational hours and the bus-bar tariff after namely 30,000 hours shall be executed according to the average tariff level, which will be approved by National Development and Reform Commission. Since the Project is located in Liaoning Province, the bus-bar tariff of the Project will be mostly likely to be approved</p>

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
			<p>at same tariff level with other newly approved windfarm projects in Liaoning Province. Furthermore, the tariff of 0.61 RMB/kWh (VAT Included) has been assessed during sensitivity analysis in the revised PDD. It has confirmed by the validation team that the project IRR (7.18% after tax) would not exceed benchmark even with assumed tariff of 0.61 RMB/kWh (VAT Included) for the first 30,000 full-load equivalent operational hours and 0.3621 RMB/kWh (VAT Included) after namely 30,000 hours.</p> <p>Therefore, the inconsistency of the bus-bar tariff between the FSR and the latest tariff policy has been reasonably substantiated. The project IRR would be unlikely to exceed the benchmark under the local tariff policy in China.</p> <p>The CL is therefore closed.</p>
<b>CL07</b> The project proponents are requested to clarify why the total static investment is not likely to reduce significantly during sensitivity analysis. Existed explanation is not plausible since the static investment does not include the tax rate and	B.3.3	The cost of materials is the main part of the total static investment. It is impossible to decrease the total investment because the price of materials, such as iron and cement, keeps increasing in recent years. Therefore,	OK. The revised IRR calculation has shown that the project IRR (after tax) would reach 8% when the total static reduces 10%. However, the total static investment of 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
the project IRR is adopted for investment analysis, on which interest rate has no impact.		the Total Investment will not drop because of the increasing price of materials. The evidence is available to the DOE.	Project would be unlikely to reduce since the industrial material prices including the steel/53/, cement and fuel cost/54/ kept increasing over the period of the year 2006~2008. The supporting referenced information in the revised PDD has been checked by the validation team to be valid. The validation team has also carried out a comparison of the industrial material price in the FSR with the information which were available on the official website of the Liaoning Provincial Price Bureau/48/. The material price was confirmed to be reasonably estimated. The actual investment costs of main equipment, as evidenced in the contracts of the wind turbine, turbine tower, turbine transformer, and transmission engineering, has only 0.87% difference from the FSR estimated values, while these main equipment costs have aggregated to 83% of the total static investment. Almost all the project investment has been in place, the total static investment of the Project is thus unlikely to reduce significantly. The CL is therefore closed.
<b>CL08</b> The windfarm projects listed in the PDD are not	B.3.3	The windfarm projects listed in the PDD have been advised according to <i>China Wind</i>	OK. The common practice has been carried out

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
<p>complete in Liaoning Province through comparison with <i>China Windfarm Installed Capacity Statistics in 2007</i>, which was checked by the Validation Team on the official website of National Windpower Engineering Technology Research Center. Furthermore, the project proponents are requested to justify the essential distinctions between the proposed project and other similar windfarm projects in Liaoning Province.</p>		<p><i>Farm Installed Capacity Statistic in 2007 by Shi Pengfei</i>. The distinctions between the proposed project and other similar windfarm projects in Liaoning Province have been re-justified in Section B.5 of PDD, and related evidence is available for DOE.</p>	<p>towards comparable windfarm projects which are located within Liaoning Province in 2007. The comparable windfarm projects are selected according to the China Windfarm Installed Capacity Statistics in 2007/36/, which was checked by the validation team and has comprehensively covered windfarm project in Liaoning Province.</p> <p>The windfarm projects, which have been published on the UNFCCC website for global stakeholder consultation, are not included for common practice according to the <i>Tool for the demonstration and assessment of additionality version 05.2/4/</i>. According to <i>China National Action Plan for Wind Power Industry Development/74/</i> published in June 2005, national debts were offered for the wind power projects at Changhai and Xianrendao in Liaoning Province since 2000. Besides, some small installations are mainly for pilot testing or demonstration purpose, which were supported by Chinese Government or foreign investment/70//74/. According to <i>2007 China Wind Power Report/70/</i>, the tariff of wind farms developed before 2005 was approved by local government and enjoyed higher tariff in Liaoning Province.</p>

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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
			<p>The tariff information of Hengshan<sup>10</sup>, Donggang<sup>10</sup>, Xianrendao<sup>11</sup>, Haiyanghong<sup>12</sup> and Sijiazi<sup>14</sup> has been accessed to be valid. Therefore, the validation team has confirmed that there are essential distinctions between the project activity and other similar windfarm projects and the project activity is not the baseline scenario and is hence additional.</p> <p>The CL is therefore closed.</p>

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# APPENDIX B

## CERTIFICATES OF COMPETENCE

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## Qualification

Zhang, Ning /

## Emission Trading

## United Nations Framework Convention on Climate Change

Auditor No.:  
(AuditorenRegNr)Appointed:  
(Zugelassen)Qualification Level: Auditor  
(Qualifikationsstufe)External:  
(Externer)Add. reviewer: ☐ yes  
(Zusätzlicher Prüfer)EAC Scopes:  
(EAC Branchen)CDM 01 - Energy industries (renewable - / non-renewable  
sources)  
CDM 03 - Energy demand  
CDM 11 - Fugitive emissions from production and consumption  
of halocarbons and sulphur hexafluorideAdd. qualification:  
(zus. Qualifikation)First Appointment:  
(Erstberufung)

2007-05-20

Valid to:  
(Gültig bis)

2010-05-19

Remarks:

Languages:

Chinese  
Chinese simplified  
Chinese traditional  
English

## Experience Exchange

Date

Location

Remarks

Accreditation (s)

## Monitoring

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

Remarks:

## History of scope allocation

Date: 2007-03-21  
Change: EAC CDM, CDM, CDM added  
By: Manfred Brinkmann  
Reason:

## History

Created: 2007-05-11 10:51:53 Manfred Brinkmann/Jpn/TUV  
Modified: 2007-05-11 10:52:04 Manfred Brinkmann/Jpn/TUV



## Qualification

Ma, Libo /

## Emission Trading

### United Nations Framework Convention on Climate Change

Auditor No. :  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒

Qualification Level: Auditor  
(Qualifikationsstufe)

External:  
(Externer)

☐

Add. reviewer:  
(Zusätzlicher Prüfer)

☐

yes

EAC Scopes:  
(EAC Branchen)

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

Add. qualification:  
(zus. Qualifikation)

First Appointment:  
(Erstberufung)

2009-06-01

Valid to:  
(Gültig bis)

2012-05-31

Remarks:

Languages:

Chinese  
English

## Experience Exchange

Date

Location

Remarks

Accreditation (s)

## Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

[View / Edit Monitoring](#)

## History of scope allocation

Date: 2009-06-02  
Change: EAC CDM added  
By: Manfred Brinkmann  
Reason:

## History

Created: 2008-03-20 15:44:05  
Modified: 2008-03-20 15:44:19

Daxun Li/Bj/Chn/TUV  
Daxun Li/Bj/Chn/TUV

## Qualification

Brinkmann, Manfred /

## Emission Trading

### United Nations Framework Convention on Climate Change

Auditor No. :  
(AuditorenRegNr)Appointed:  
(Zugelassen)☒ jaQualification Level: Auditor  
(Qualifikationsstufe)External:  
(Externer)☐ jaAdd. reviewer: ☒ yes  
(Zusätzlicher Prüfer)EAC Scopes:  
(EAC Branchen)

CDM 03 - Energy demand  
 CDM 04 - Manufacturing industries  
 CDM 05 - Chemical industry  
 CDM 10 - Fugitive emissions from fuels (solid; oil and gas)  
 CDM 11 - Fugitive emissions from production and consumption  
 of halocarbons and sulphur hexafluoride  
 CDM 12 - Solvents use  
 CDM 01 - Energy industries (renewable - / non-renewable  
 sources)  
 CDM 06 - Construction  
 CDM 13 - Waste handling and disposal

Add. qualification:  
(zus. Qualifikation)First Appointment: 2004-03-03  
(Erstberufung)Valid to:  
(Gültig bis)

2010-03-02

Remarks:

Languages: German  
English  
French

## Experience Exchange

Date	Location	Remarks	Accreditation (s)
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## Monitoring

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

Remarks:

## History of scope allocation

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

## History

Created:	2003-12-11 13:27:13	-
Modified:	2007-11-22 11:00:46	Manfred Brinkmann/Jpn/TUV

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