



VALIDATION REPORT

CGN Inner Mongolia Zhurihe Phase II Wind Farm Project in China

REPORT No. 2009-1468

REVISION No. 02

DET NORSKE VERITAS



VALIDATION REPORT

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Project Name: CGN Inner Mongolia Zhurihe Phase II Wind Farm Project
Country: China
Methodology: ACM0002
Version: 10
GHG reducing Measure/Technology: Wind energy based power generation
ER estimate: 119 319tCO₂e per 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

It is DNV's opinion that the "CGN Inner Mongolia Zhurihe Phase II Wind Farm Project" in China, as described in the PDD version 4.0 of 03 June 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 version 10. DNV thus requests the registration of the project as a CDM project activity.

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Report title: CGN Inner Mongolia Zhurihe Phase II Wind Farm Project in China		
Work carried out by: Huang, Peng; Li, Lei; Zhu, Chao		
Work verified by: Tang, Zhiang(Walter)		

Key words:
 Climate Change
 Kyoto Protocol
 Validation
 Clean Development Mechanism

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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Requests for clarification
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CRM	Carbon Resource Management
DNA	Designated National Authority
DNV	Det Norske Veritas Certification Ltd
DOE	Designated Operational Entity
EIA	Environmental Impact Assessment
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Return Rate
LoA	Letter of Approval
MP	Monitoring Plan
NCV	Net Caloric Value
NCPG	North China Power Grid
NDRC	National Development and Reform Committee
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
RMB	Renminbi, Chinese currency (yuan)
UK	the United Kingdom of Great Britain and Northern Ireland
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “CGN Inner Mongolia Zhurihe Phase II Wind Farm Project” in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The host Party is China and the Annex I Party is the United Kingdom of Great Britain and Northern Ireland. Both Parties fulfill the participation criteria and have approved the project and authorized the project participants. The DNA of China confirmed that the project assists in achieving sustainable development.

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

The project correctly applies ACM0002 version 10: “Consolidated baseline & monitoring methodology for grid-connected electricity generation from renewable sources”.

By generating renewable energy the project will displace fossil fuel based grid electricity. The project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The monitoring plan complies with the applied methodology ACM0002 version 10. Adequate training and monitoring procedures have been developed and will be implemented before the starting date of the crediting period.

The total emission reductions from the project are estimated to be on the average 119 319 tCO₂e per year over the 7-year renewable 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.

In summary, it is DNV’s opinion that the “CGN Inner Mongolia Zhurihe Phase II Wind Farm Project” in China as described in the PDD version 4.0 dated 03 June 2010 /1/meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 version 10. DNV thus requests the registration of the “CGN Inner Mongolia Zhurihe Phase II Wind Farm Project” as a CDM project.



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2 INTRODUCTION

Carbon Resource Management Ltd. has commissioned DNV to perform a validation of the “CGN Inner Mongolia Zhurihe Phase II Wind Farm Project” in China (hereafter called “the project”). This final report summarises the initial findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

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, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 version 10 /5/. The validation team has, based on the recommendations in the Validation and Verification Manual /4/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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



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3 METHODOLOGY

The validation consisted 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 table lists the documentation that was reviewed during the validation:

- /1/ Carbon Resource Management Ltd.: Project Design Document for CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, Version 1.1, 28 July 2009; Version 2.0, 19 October 2009; Version 3.0, 09 November 2009; Version 4.0, 03 June 2010
- /2/ NDRC: Letter of Approval issued, ref No.2049, June 2009
<http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=3680>
- /3/ Department of Energy & Climate Change: Letter of Approval issued by the United Kingdom of Great Britain and Northern Ireland. 15 October 2009
- /4/ EB 51 Report Annex 3: *Validation and Verification Manual*. Version 01.1, 04 December 2009.
http://cdm.unfccc.int/EB/051/eb51_repan03.pdf.
- /5/ EB 47 Annex 7: ACM0002 Approved methodology, “*Consolidated methodology for grid-connected electricity generation from renewable sources*”, version 10, 28 May 2009.
- /6/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, version 5.2, 26 August 2008.
- /7/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, version 02, 16 October 2009.
- /8/ Inner Mongolia Power Exploration & Design Institute:
The feasibility study report (FSR) of CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, August 2008.
Explanation of the capacity change of CGN Zhurihe II Wind Farm Project; 26 November 2009
The Revised FSR of CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, 02 March 2009
- /9/ Development and Reform Commission of Inner Mongolia Autonomous Region: Approval letter for FSR, 12 February 2009.
- /10/ Inner Mongolia Power Exploration & Design Institute: The Environment Impact Assessment (EIA) of CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, March 2008.
- /11/ Environment Protection Bureau of Inner Mongolia Autonomous Region: Approval letter for EIA, 26 March 2009.
- /12/ IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Reference Manual.2006.
- /13/ CDM Executive Board: Guidance for request for deviation titled “Application of AM0005 and AMS-I.D in China” (<http://cdm.unfccc.int/Projects/Deviations>).



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- /14/ China Electric Power Yearbook 2004-2008.
- /15/ China Energy Statistical Yearbook 2006-2008.
- /16/ The General Office of the State Council: Notice on Strictly Prohibiting the Installation of Fuel-fired Generation with the Capacity of 135 MW or below, decree No. 2002.6
- /17/ Updated version of the boundary of North China Power Grid defined by Chinese DNA, 2 July 2009:
http://qhs.ndrc.gov.cn/qjfzjz/t20090703_289357.htm
- /18/ There is little hydroelectric source that can be utilized in Inner Mongolia:
<http://www.shuidianzhan.net/snzy/250.html>
by China water information website dated 2007.
- /19/ Solar PV, geothermal and biomass for the similar installed capacity as the proposed project are alternatives far from being attractive investment in Inner Mongolia:
<http://finance.people.com.cn/GB/1038/59942/59949/6294546.html>
by China People website dated 2007.
- /20/ NDRC: "Codes on Compiling Feasibility Study Report of Wind Farms", prescribes the -10% to +10% variation range (http://www.windpower.org.cn/news/links/js_2005_0508.htm). 25 May 2005.
- /21/ State Power Corporation of China: *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*. Beijing: China Electric Power Press, 2003.
- /22/ The prices, including equipments and commodities, also the labor costs have been increasing in recent years:
<http://energy.people.com.cn/GB/5720709.html>; by China People website dated 2007.
<http://www.nmgtj.gov.cn/Html/jjshfztjgb/2009-7/0/2385.shtml>; by the Inner Mongolia Autonomous Region Bureau of Statistic.
- /23/ There is an increasing tendency of the salary and materials purchasing prices:
<http://www.nmgtj.gov.cn/Html/jjshfztjgb/2009-7/0/2385.shtml>
by the Inner Mongolia Autonomous Region Bureau of Statistic; dated 12 March 2009
- /24/ NDRC:
Notification of electricity tariff for wind power projects issued by NDRC (Fa Gai Jia Ge [2007]1260), 09/06/2007
10 Notification of electricity tariff for wind power projects issued by NDRC (Fa Gai Jia Ge [2007]3303), 03/12/2007
11 Notification of electricity tariff for wind power projects issued by NDRC (Fa Gai Jia Ge [2008]1876), 23/07/2008
12 Notification of electricity tariff for wind power projects issued by NDRC (Fa Gai Jia Ge [2009]1906), 20/07/2009
- /25/ Chinese National Development and Reform Commission: Separate Power Plants from Network and Compete in Price to Enter Network
http://www.ndrc.gov.cn/xwfb/t20050708_28096.htm dated on 11 April 2002.
- /26/ Shi Pengfei: Cumulative wind installation in China till 2007
http://www.cwea.org.cn/download/display_info.asp?cid=2&sid=&id=25, 24 March 2008
- /27/ The Dali Wind Power Project Phase III belongs to "the fourth issue of national debt special fund project":
<http://www.chifeng.gov.cn/html/2008-11/3130.shtml>.



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- /28/ Da Mao Qi Bailingmiao wind farm uses foreign capital and thus not eligible for CDM under the Chinese DNA rules. Therefore, the project had to be implemented as a Gold Standard VER project:
<http://china.camcoglobal.com/zh/chinacasestudyview.obyx?cs=honiton.html>
[http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/423/GS-VER\(Retroactive\)Honiton\(1\)-080111_GSP.pdf](http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/423/GS-VER(Retroactive)Honiton(1)-080111_GSP.pdf)
- /29/ CGN Wind Power Co., Ltd: Board meeting report to undertake the project as a CDM project, 16 December 2008
- /30/ NDRC: Written Notification of the Commencement of the Project Activity, 11 May 2009
 NUFCCC secretariat: Written Notification of the Commencement of the Project Activity, 05 September 2009
- /31/ Turbine and boost voltage base construction contract between CGN Wind Power Co., Ltd & Inner Mongolia Electric Power Transmission and Transformation Co., Ltd, June 2009
 35kV collector line and box type transformer construction contract between CGN Wind Power Co., Ltd & Xilinguole Power Construction Co., Ltd, 7 November 2009
- /32/ Turbine and Tower Purchase contract between CGN Wind Power Co., Ltd & Beijing North Heavy Turbine Co., Ltd, 15 March 2009.
- /33/ CGN Wind Power Co., Ltd: Stakeholder questionnaires (50 copies), March 2009.
- /34/ Inner Mongolia Autonomous Region Department of Land and Resources:
 Land using intention letter for the CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, 30 April 2009
- /35/ CGN Wind Power Co., Ltd: Wind power plant training plan and CDM monitoring manual, August 2009
- /36/ Inner Mongolia Power (Group) Co., Ltd: Approval letter for the grid connection of CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, 16 May 2009
- /37/ The IRR calculation spreadsheet of the CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, Version 1.0, 28 July 2009
- /38/ The emission factor calculation spreadsheet of the CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, Version 1.0, 28 July 2009
- /39/ The CER calculation spreadsheet of the CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, Version 1.0, 28 July 2009
- /40/ The references of the taxes involved in the project:
 Income tax (25%)
<http://202.108.90.130/n480462/n503829/n513111/n513397/7428564.html>
 VAT (8.5% for the wind farm project)
<http://202.108.90.130/n8136506/n8136593/n8137537/n8138502/8714515.html>
 City build tax (5% for the project located in the county or town)
<http://202.108.90.130/n480462/n480513/n480979/n554229/999267.html>
<http://202.108.90.130/n480462/n480513/n480979/n554229/1007841.html>
 Education added tax (3%)
http://www.gov.cn/jrzg/2005-09/24/content_69824.htm
- /41/ Renewable Energy Law was issued by China government on 28 May 2008.
- /42/ Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses came into effective on 1 January 2006.



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- /43/ Notification of electricity tariff for wind power projects, issued by NDRC, [2006] No.:2908, dated 22 December 2006
- /44/ Chinese National Development and Reform Commission, Separate Power Plants from Network and Compete in Price to Enter Network, March, 2002,
- /45/ Nei Fa Gai Zi[2004] 1093, issued by Inner Mongolia DRC on 29 April 2004
- /46/ Inner Mongolia Power Exploration & Design Institute: Further explanation for the investment analysis in the proposed project. 9 October 2009
- /47/ Registered wind power projects in West Inner Mongolia of China validated by DNV:
 Ref: 0870, Inner Mongolia Huitengxile Jingneng 100MW Wind Power Project;
 Ref: 1261, Guohua Inner Mongolia Huitengliang Wind Farm Project;
 Ref: 1621, Inner Mongolia Bayannaoer Chuanjingsumu 49.3MW Wind Power Project;
 Ref: 1823, Inner Mongolia Bayin'aobao 49.5MW Wind Farm Project (Phase I);
 Ref: 2027, Inner Mongolia Bayinhanggai 49.5MW Wind Farm Project;
 Ref: 2038, Fuhui Inner Mongolia Tugurige Wind Farm Project;
 Ref: 2047, Guohua Inner Mongolia Huitengliang West Wind Farm Project;
 Ref: 2072, Fuhui Inner Mongolia Narenbaolige Wind Farm Project;
 Ref: 2113, CGN Inner Mongolia Huitengliang 300MW Wind Power Project;
 Ref: 2135, Inner Mongolia Baotou Bayin Wind Power Project;
 Ref: 2406, CGN Inner Mongolia Duerbote Wind farm Project.

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

1. The PDD was updated from version 1.1 to version 4.0 on 03 June 2010.
2. The version of "*Tool to calculate the emission factor for an electricity system*" has been updated to the version 2.
3. Timeline of the project process has been Revised adding more details in the PDD Section B.5.
4. More references have been added to explain why it is unlikely for the tariff to increase 12.40% in the sensitive analysis.
5. More references have been added to explain why it is unlikely for the O&M cost to drop by 63% in the sensitive analysis.
6. Monitoring frequency of metering equipment has been added in the monitoring plan in PDD B.7.

After reviewing the Revised PDD, DNV issued this final validation report and opinion.

3.2 Follow-up Interviews with Project Stakeholders

On 17 September 2009, Huang, Peng (Peter) and Li, Lei (Kevin) of DNV Climate Change Service performed interviews with the project owner and the CER buyer in DNV Beijing office, and a formal meeting was carried out to confirm selected information and to resolve issues identified in the document review.

During the desk review, the relevant documents including the FSR, Revised FSR /8/, the EIA /10/ and approval /11/, the wind turbines purchase contract /32/ and construction contract /31/ were provided and assessed. The information about this project was able to be confirmed



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from these documents. The project is a new build wind farm project and the project construction started in June 2009. Through assessing the documents provided by the project participant, DNV can confirm that the project is a newly built wind farm project, and the project was under construction at the time of PDD publication for global web-hosting. In addition, according to the EIA /10/ no migration was involved in this project. No further issues can be assessed through on site visit.

Thus, DNV can justify that a physical site visit for this project was not arranged during the validation process.

The main topics and personnel of the interviews are summarized in the table below:

	Date	Name	Organization	Topic
/48/	17 Sep. 2009	Mr. Wang Zisong	CGN Wind Power Co., Ltd	<ul style="list-style-type: none"> ➤ The development of wind power project in the Hebei Province ➤ Information of project construction ➤ The approval status (incl. EIA approval, the feasibility study report approval, CDM project approval) ➤ Project management ➤ Emission reduction monitoring plan ➤ Consulting process for stakeholder's comments ➤ Investment risks and barriers
/49/	17 Sep. 2009	Ms. Zhu Qiyao	Carbon Resource Management Ltd.	<ul style="list-style-type: none"> ➤ Baseline determination of the project ➤ Applicability of selected methodology ACM0002 ➤ Issues related to the additionality ➤ Common practice analysis ➤ Emission reductions calculation ➤ Emission reduction monitoring plan and project management

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 DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the CGN Inner Mongolia Zhurihe Phase II Wind Farm Project is enclosed in Appendix A to this report.



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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.

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

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>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.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

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
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1: Validation protocol tables



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3.4 Internal Quality Control

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

3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Huang	Peng (Peter)	China		✓	✓	✓		
GHG auditor/Project Manager	Li	Lei (Kevin)	China	✓	✓	✓			
Specialist with sector experience	Zhu	Chao	China						✓
Technical reviewer	Tang	Zhiang (Walter)	China					✓	

The qualification of each individual validation team member is detailed in Appendix B to this report.



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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 version 4.0 of 03 June 2010 /1/.

4.1 Participation Requirements

The project participants are CGN Wind Power Co., Ltd of China and Carbon Resource Management Ltd. of the United Kingdom of Great Britain and Northern Ireland. Both participating parties, China and the the United Kingdom of Great Britain and Northern Ireland fulfill the requirements for participating in a CDM project activity. China ratified the Kyoto Protocol on 30 August 2002 and has established DNA, National Development and Reform Commission (NDRC). the United Kingdom of Great Britain and Northern Ireland also ratified the Kyoto Protocol on 31 May 2002 and has established DNA, Department of Energy & Climate Change.

DNV has verified the original copies of the two LoAs provided by the project participant, and could confirm that:

The DNA of China has issued the LoA /2/ on June 2009, authorizing CGN Wind Power Co., Ltd as project participant and also confirmed that the project assists in achieving sustainable development;

The DNA of the United Kingdom of Great Britain and Northern Ireland has issued the LoA /3/ on 15 October 2009, authorizing Carbon Resource Management Ltd. as project participant.

The validation did not reveal any information that indicates the project can be seen as a diversion of official development assistance (ODA) funding towards China. According to the LoA issued by the United Kingdom of Great Britain and Northern Ireland, DNV has verified that any public funding for the project activity did not result in a diversion of the official development assistance of the United Kingdom of Great Britain and Northern Ireland /3/.

4.2 Project Design

The project involves installation and operation of 25 wind turbines in Zhurihe Town, Xilinguole League, Inner Mongolia Autonomous Region of People's Republic of China. It is located at the attitude 42° 27' 11" (N) and latitude 112° 48' 03" (E) /8/.

The installed capacity of each unit is 2 MW, thus constituting a total generation capacity of 50 MW /8/. The wind turbines will be supplied by Beijing North Heavy Turbine Co., Ltd, which is a China domestic company, and the turbine technologies employed in the proposed project activity are advanced China domestic technologies without technology transfer activity involved /32/. DNV was able to confirm that the project design engineering reflects current good practice.

According to the Revised FSR prepared by a qualified third party (contracted with the project participant) Inner Mongolia Power Exploration & Design Institute in 02 March 2009 /8/, DNV was able to verify that the fluctuation of wind speed has been taken into consideration and based on that conservative assumptions it has been made regarding the annual electricity generation and the full load annual operation hours, which are 125 573 MWh and 2 512 hours



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respectively. The electricity generated from the project will be transmitted to Wenduer substation of NCPG via a transmission line.

Being a renewable electricity project, the project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO₂ emissions from electricity generation by fossil fuel power plants /8//10/.

The date of turbine purchase contract between CGN Wind Power Co., Ltd & Beijing North Heavy Turbine Co., Ltd was 15 March 2009 /32/, which is the first significant financial commitment for the project, and this is defined as the project's starting date.

The expected operational lifetime of the project activity is 20 years. A renewable crediting period of 7 years has been chosen for the project, starting from 1 July 2010 or the registration date whichever is later. The emission reductions are estimated to be 119 319 tCO₂e and 835 233 tCO₂e over the first seven-year crediting period.

4.3 Baseline Determination

4.3.1 Applicability

The project correctly applies the approved baseline methodology ACM0002 (version 10), titled "Consolidated methodology for grid-connected electricity generation from renewable sources" /5/.

The applied baseline methodology is justified as it has been demonstrated that the project activity ensures that:

- The project activity is a grid connected renewable power generation project activity that installs a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) /8/.
- It does not involve switching from fossil fuel to renewable energy at the project site /8/.
- The project is connected to NCPG which geographical and system boundaries are clearly identified and information on the characteristics of this grid is available /17/.

4.3.2 Project boundary

The spatial extent of the project boundary is clearly defined as the site of project activity and all power plants connected physically to NCPG including Beijing, Tianjin, Hebei, Shanxi, Shandong, West Inner Mongolia power grids, to which the project is connected. This is in line with the delineation of grid boundaries as provided by the DNA of China /17/. The defined project boundary is in line with ACM0002 (version 10) /5/.

The selected sources and gases are justified for the project activity. Emission sources and gases included in the project boundary are:

	<i>GHGs involved</i>	<i>Description</i>
Baseline emissions	CO ₂	The baseline emission factor for the project is determined <i>ex-ante</i> as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) of NCPG.
Project emissions	N/A	Project emission is regarded as zero as the



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		project is a renewable energy (wind source) project.
Leakage	N/A	There are no leakages that need to be considered in applying this methodology.

4.3.3 Baseline determination

Since the project activity is the installation of a new grid-connected renewable power plant and additional, cf. Section 4.4, the baseline scenario is that the electricity delivered to the grid by the project activity would otherwise have been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system” version 2.

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

The baseline determination is transparent and reasonable.

4.4 Additionality

The additionality of the project has been established using the “*Tool for the demonstration and assessment of additionality*” version 5.2 approved by the CDM-EB /6/.

4.4.1 CDM consideration and continued action to secure CDM status

On 15 March 2009, the turbine purchase contract was signed /32/, which is the first significant financial commitment for this project. On June 2009, the construction contract between CGN Wind Power Co., Ltd & Inner Mongolia Electric Power Transmission and Transformation Co., Ltd was signed /31/. Based on these above, 15 March 2009 was substantiated as the starting date of the project activity.

The FSR was produced on August 2008 by Inner Mongolia Power Exploration & Design Institute, and then CDM was considered to apply in the broad meeting of CGN Wind Power Co., Ltd on 16 December 2008 /29/.

The FSR was revised on 02 March 2009 also by Inner Mongolia Power Exploration & Design Institute because of the wind turbine supply market in China/8/.

The time of Revised FSR is after the time of CDM decision of the proposed project, but as the statement of section 4.4.5 below, the key parameters in FSR and Revised FSR were compared. The key parameters in the FSR and Revised FSR were tested in the IRR calculation, and both of the IRR results were below the benchmark. Thus DNV can determine that the revision of FSR did not impact the additionality.

The validation started by global stakeholder consultation on 18 August 2009, only 5 months after the starting date, and DNV can confirm the project participant performed continued action to secure CDM status.

In accordance with the EB 48 annex 61, the project owner informed Chinese DNA and the UNFCCC secretariat of the project commencement and their intention to seek CDM status on



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11 May 2009 and 05 September 2009, respectively /30/, which is within the 6 months from the starting date. Thus serious consideration of CDM and efforts to secure CDM status was therefore justified.

4.4.2 Identification of alternatives to the project activity consistent with current laws and regulations

Three alternatives to the project have been identified and discussed:

- a) The proposed project activity undertaken without being registered as a CDM project activity.
- b) A fossil fuel-fired power plant or other renewable energy with comparable capacity or electricity generation.
- c) Continuation of the current situation: operation of grid-connected power plants and addition of new generation sources in the NCPG.

DNV considers the list of realistic and credible alternatives to be complete.

For the alternative b), with installed new thermal power capacity of 25 MW (equivalent coal-fired power plant compared with the proposed 50 MW wind project), does not comply with the Chinese law. This law strictly prohibits the installation of thermal power plants with a capacity below 135 MW in areas covered by large grids such as provincial grids /16/. DNV was also able to confirm that the proposed project is located in the region which has no other exploitable sources of renewable energy such as hydropower energy /19/. Also due to the technology development status and the high cost for power generation, solar PV, geothermal and biomass with the same annual electricity output as the proposed project are alternatives far from being attractive investment in the region /18/. Hence, alternative b) is not a credible alternative for the project developer and has been eliminated from further discussion.

It has been adequately demonstrated that alternative a) and c) are the alternatives consistent with current laws and regulations as potential alternatives and thus will be discussed at the next steps.

4.4.3 Investment analysis: Choice of approach

As the project generates financial and economic benefits other than CDM related income through the sales of electricity and the alternative for the baseline scenario of the proposed project is not a similar investment project, a benchmark analysis is selected for conducting the investment analysis.

4.4.4 Investment analysis: Benchmark selection

According to *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Project* /21/ which is still in valid, an IRR of 8% (after tax) for the total investment of a project is regarded as a benchmark for investing in large scale hydropower plants, fossil fuel fired plants as well as wind farm projects in China. The benchmark of 8% (after tax) is therefore appropriate for this project. DNV was able to confirm this is suitable and reasonable as following:



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1. This benchmark was determined by the national administration of this industry in China /21/;
2. This benchmark is for project and after tax and the investment analysis for this project will be for project and after tax also;
3. This *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects* /21/ is referred to the risk premiums of large scale wind farm power project.

4.4.5 Investment analysis: Input parameters

A FSR is in China required to be developed by a third party accredited of this task directly by the government. An approval letter of the FSR will be issued by the government only after the FSR passes the public assessment of the sector experts designated by the government. It is in DNV's opinion that a FSR can be regarded as a reliable and trustworthy source of information coming from a recognized entity once it has the approval letter from the government.

The FSR of the proposed project was completed on August 2008, but because of the wind turbine supply situation in China, the Inner Mongolia Power Exploration & Design Institute developed the Revised FSR on 02 March 2009 /8/, in which the capacity of the proposed project has been adjusted from 49.5MW into 50MW and some parameters were changed. All the construction, purchase and operation of the proposed project were based on the Revised FSR.

The investment parameters in the FSR and Revised FSR were compared as below:

parameter	FSR (August 2008)	Revised FSR (2 March 2009)	Note
Capacity	49.5MW (33*1.5MW)	50MW(25*2MW)	
Net electricity generation	120391MWh	125573MWh	4.3% higher than the estimated value in the FSR
Load factor	27.76%	28.7%	
Static investment	469.72 Million RMB Yuan	486.66 Million RMB Yuan	3.6% higher than the estimated value in the FSR
Tariff	0.51 RMB Yuan/kwh (incl. VAT)	0.51 RMB Yuan/kwh (incl. VAT)	
Annual O & M cost	11.34 Million RMB Yuan	11.61 Million RMB Yuan	
Other fee	18 RMB Yuan/kw	18 RMB Yuan/kw	
VAT rate	8.5%	8.5%	
City build tax rate	5%	5%	
Education added tax rate	3%	3%	
Income tax rate	25%	25%	
IRR	6.45%	6.47%	

As shown in the above table, if the original parameters in the FSR were applied, the IRR is still below the benchmark. Thus DNV can determine that the input parameters in the Revised FSR are suitable and acceptable.

All input parameters used in the financial analysis have been sourced from the Revised FSR by Inner Mongolia Power Exploration & Design Institute /8/, which can thus be considered information provided by an independent and recognized source.



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DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the Revised FSR /8/, and then was able to confirm that the values applied are consistent.

The Revised FSR was completed in 02 March 2009, which is earlier than the project activity starting date (15 March 2009). Given this relative short period of time between the Revised FSR and the decision to proceed with the project activity it is unlikely in the context of the project that the input values would have materially changed and that it is thus reasonable to assume that the Revised FSR has been the basis of the decision to proceed with the investment in the project.

The grid system in Inner Mongolia is split into two power grid, the West Inner Mongolia grid which is connected to the NCPG grid and the East Inner Mongolia grid which is connected to the NEPG grid. This project belongs to the West Inner Mongolia Power Grid and wind power projects in West Inner Mongolia were selected as same local vicinity to compare the tariff and its trend. The input parameters used in the financial analysis were compared with the data from other similar registered wind power CDM projects validated by DNV /47/ in the West Inner Mongolia comparing investment costs per kW, PLF and the O&M per MW etc. The following table illustrates the comparison of these parameters between the project and the registered CDM projects in the same region West Inner Mongolia.

Table 2: Comparison result of investment cost per kW, PLF and the O&M costs per MW between wind power projects in West Inner Mongolia

Compared Data	Proposed Project Value	Compared Value in West Inner Mongolia	
Investment costs per kW (RMB/kW)	9 733	Max	10393 (ref. 1823)
		Min	7736 (ref. 0870)
Annual O&M cost per MWh (RMB/MWh)	92	Max	109 (ref.1621)
		Min	62 (ref. 2153)
Load Factor (%)	28.7	Max	30 (ref. 0870)
		Min	25 (Ref. 2027)

Annual Power Generation

Plant load factor comparison showed that the annual load factor (28.7%) of the proposed project is close to those values (25% to 30%) of the similar projects in the same region West Inner Mongolia.

Annex 11 of CDM-EB 48th meeting report gives a guideline for validation of plant load factor for renewable energy. One option is to use plant load factor provided to the government while applying the project activity for implementation approval. The Revised FSR has this purpose and hence according to current CDM regulation, the checking that the value is in line with the Revised FSR should be considered sufficient for validation of plant load factor /8/. This was the case for this project.

The annual output is estimated in the Revised FSR based on the long term weather statistic data provided by local meteorological station from year 1988 to year 2006 and the annual average wind speed of the project site tends to decrease on the basis of past over 20 years' wind resources and to gradually be stable in recent years /8/.



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Tariff

The tariff was cross-checked with other tariffs for wind power projects in West Inner Mongolia (Table 3). There are three distinctive tariff spans of non concessional projects in West Inner Mongolia can be verified:

- (a) The first group is 0.609~0.64786 RMB/kWh (incl. VAT) before 2002;
- (b) The second group consists of 1 project with the tariff of 0.55 RMB/kWh (incl. VAT), approved by Inner Mongolia DRC in April 2004;
- (c) After the implementation of the “*Renewable Energy Law /41/*” and “*Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses*” ([2006] no.7) /42/, the price has been approved by NDRC. The tariffs of 3 projects were approved individually (0.579, 0.549 and 0.548 RMB/kWh, incl. VAT) on 22 December 2006 ([2006]2908) /43/ by NDRC. After this date, NDRC unified the tariff in West Inner Mongolia to be 0.51 RMB/kWh (incl. VAT) on 9 June 2007 /24/ and the subsequent tariffs have been unified and maintained the same /24/.



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The tariff of projects in West Inner Mongolia

	Tariff (RMB/kWh, incl. VAT)	Approval	Date	Project Name	installation start time	Is it CDM project or apply for CDM?
Conventional projects						
1	0.55	[2004]1093	Jun-04	Huitengxile Windfarm Project	2004	Yes
2	0.579	[2006]2908	Dec-06	Inner-Mongolia Ximeng Abag 49.5MW Wind Power Project	Not available	Yes
3	0.5497	[2006]2908	Dec-06	Inner Mongolia Wulatezhongqi Wind farm	2007	Yes
4	0.548	[2006]2908	Dec-06	Inner Mongolia Bailingmiao Wind-farm	2007	GS-VER
5	0.51	[2007]1260	Jun-07	Inner Mongolia Datang Zhuozhi Wind Farm	2006	Yes
6	0.51	[2007]3303	Dec-07	Inner Mongolia Bayannaer Chuanjingsumu 49.3MW Wind Power	2007	Yes
7	0.51	[2007]3303	Dec-07	Expansion Project of Huadian Inner Mongolia Huitengxile Wind Farm	2007	Yes
8	0.51	[2007]3303	Dec-07	Guohua Inner Mongolia Huitengliang West Wind Farm Project	2007	Yes
9	0.51	[2007]3303	Dec-07	Goldwind Damao Wind Farm Project	Not available	Yes
10	0.51	[2007]3303	Dec-07	Fuhui Inner Mongolia Tugurige Wind Farm Project	2007	Yes
11	0.51	[2007]3303	Dec-07	Fuhui Inner Mongolia Narenbaolige Wind Farm Project	2007	Yes
12	0.51	[2007]3303	Dec-07	Inner Mongolia Bayinhanggai 49.5MW Wind Farm Project	Not available	Yes
13	0.51	[2007]3303	Dec-07	Guohua Inner Mongolia Huitengliang Wind Farm Project	2007	Yes
14	0.51	[2007]3303	Dec-07	Inner Mongolia Huitengliang 49.5MW Wind Power Project	2007	Yes
15	0.51	[2007]3303	Dec-07	Inner Mongolia North Longyuan Huitengxile Wind Farm Project	2007	Yes
16	0.51	[2007]3303	Dec-07	Xilinguole Huitengliang Wind Power Project Guotai Phase I	Not available	Yes
17	0.51	[2007]3303	Dec-07	Inner Mongolia North Longyuan Zhurihe Wind Farm Project	2006	Yes
18	0.51	[2007]3303	Dec-07	Inner Mongolia Bayannaer Chuanjingsumu Wind Power Project	2007	Yes
19	0.51	[2007]3303	Dec-07	Inner Mongolia Siziwangqi Bayin'aobao Wind Power Project	Not available	Yes
20	0.51	[2007]3303	Dec-07	Sinohydro Inner Mongolia Ximeng Honggeer Wind Power Project	Not available	Yes
21	0.51	[2007]3303	Dec-07	Inner Mongolia Goldwind Damao Wind Farm Phase II Project	Not available	Yes
22	0.51	[2007]3303	Dec-07	Inner Mongolia Bayinxile Wind Power Project	Not available	Yes
23	0.51	[2007]3303	Dec-07	Inner Mongolia Ximeng Zheligtentu Wind Farm Phase I Project	Not available	Yes
24	0.51	[2007]3303	Dec-07	Inner Mongolia Hangjin Yihewusu Wind Power Project	2007	Yes
25	0.51	[2007]3303	Dec-07	Inner Mongolia Zhuozhi II Wind Power Project	Not available	Yes
26	0.51	[2007]3303	Dec-07	Inner Mongolia Bayin'aobao 49.5MW Wind Farm Project (Phase I)	Not available	Yes
27	0.51	[2007]3303	Dec-07	Inner Mongolia Saiwusu I Wind Power Project	Not available	Yes
28	0.51	[2007]3303	Dec-07	Beijing Energy Huitengxile 49.5MW Wind Power Project	Not available	Yes
29	0.51	[2007]3303	Dec-07	Baiyun Ebo Wind Farm Inner Mongolia	Not available	Yes
30	0.51	[2007]3303	Dec-07	Alashan Bayannuogong Wind Farm Project	Not available	Yes
31	0.51	[2007]3303	Dec-07	Bayannaer Wulatehouqi Hailisu Wind Farm Project	Not available	Yes
32	0.51	[2007]3303	Dec-07	Xilinguole Huangqi Huawei Wind Farm Project	Not available	Yes
33	0.51	[2007]3303	Dec-07	Chuanjing Wind Farm Inner Mongolia Luneng Phasell	Not available	Yes
34	0.51	[2008]1876	Jul-08	Inner Mongolia Duolun Daxishan 30.6MW Wind Power Project	Not available	Yes
35	0.51	[2008]1876	Jul-08	Inner Mongolia Taipusi Gongbaolage Wind Farm Project	Not available	Yes
36	0.51	[2008]1876	Jul-08	Inner Mongolia Ximeng Huitengliang Area Phase I Wind Power Project	Not available	Yes
37	0.51	[2008]1876	Jul-08	Inner Mongolia Huitengliang Phase II Wind Power Project	Not available	Yes
38	0.51	[2008]1876	Jul-08	Inner Mongolia Bayannaer Chuanjingsumu III Wind Power Project	Not available	Yes
39	0.51	[2008]1876	Jul-08	Inner Mongolia Erlanhaote Phase I Wind Farm Project	2007	Yes
	0.515	Average				
Concessional projects						
1	0.382		Sep-04	Inner Mongolia Beijing International Power Huitengxile Wind Farm	2006	Yes
2	0.382		Sep-04	Huadian Inner Mongolia Huitengxile 100.25MW Wind Farm Project	2006	Yes
3	0.4056		Aug-06	Inner Mongolia Ximeng Huitengliang Windfarm	Not available	Yes
4	0.4056		Aug-06	CGN Inner Mongolia Huitengliang 300MW Wind Power Project	Not available	Yes
5	0.4656		Aug-06	Inner Mongolia Baotoubayin Wind-farm	Not available	Yes
6	0.468		Nov-07	Inner Mongolia Wulanyiligeng Wind Farm	Not available	Yes
	0.418	average				
Projects prior to 2002						
1	0.609			Inner Mongolia Huitengxile Wind Power Project	1996	No
2	0.64786			Xilinhaote Baoligenshan Wind Power Project	1995	No
3	0.609			Inner Mongolia Shangdou Wind Power Project	1994	No
4	0.609			Inner Mongolia Zhurihe Wind Power Project	1989	No
	0.619	average				

In March 2002, the power companies and grid were separated to be more market oriented, projects before 2002 (0.609~0.64786 RMB/kWh, incl. VAT) enjoyed higher price than the present project /44/ and such high tariffs could no longer be obtained. Therefore, DNV can conclude that these tariffs were not applicable to the proposed project.



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There was a transformation period since the implementation of the *Notice of Electric Power Sector Reform Programme*, and the tariff of Huitengxile Windfarm project (UN Ref. 0064) was approved during this period. The tariff of this project was approved by Inner Mongolia DRC in April 2004 to be 0.55 RMB/kWh /45/. This project faced barriers and has been registered under CDM.

The “*Renewable Energy Law*” /41/ and “*Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses*” ([2006] no.7) /42/ came into effective on 1 January 2006. From then on, renewable energy, such as wind, hydro, solar, geothermal, etc., was encouraged and the related scheme has provided more and clearer guidance. For wind farms, domestic technology and turbines were promoted and developed and NDRC began to approve wind farm tariffs.

As already mentioned, the tariffs of 3 projects were approved individually (0.579, 0.549 and 0.548 RMB/kWh, incl. VAT) on 22 December 2006 ([2006]2908) /43/. China’s wind energy sector progressed from the initial small scale stage to the market expanding stage in 2006, and the wind power technology, economic environment, and mapping of wind resources were in a research and development stage. The 3 projects were approved case by case in the context of specific project situations, such as wind resources, construction condition, etc.

Table 4 Project information for the 3 projects whose tariff is higher than the proposed project

No	Project information	Tariff (RMB)	Installed capacity (MW)	Investment cost (RMB/kW)	O&M cost per MWh(RMB /MWh)	Plant load factor(%)	IRR without carbon support	Remark
1	Inner Mongolia Ximeng Abag Wind Farm	0.579	49.5	11 503	98	27.17%	7.53%	UNFCCC Ref 2135, registered
2	Inner Mongolia Wulatezhongqi Wind farm	0.5497	45	10 489	70	22.82%	6.10%	Request for register, correction, UNFCCC Ref 2597
3	Inner Mongolia Bailingmiao Windfarm (West)	0.548	50	11 027	96	28.95%	6.59%	GS-VER
	The Proposed project	0.51	50	9 733	92	28.7%	6.47%	

As a further cross-check in table 4 above, the tariff and investment costs per installed capacity of the three projects with higher capacity were tested in the investment analysis of the proposed projects. The project-IRR would in these cases be 5.95%, 6.46% and 5.79%, compared to the project-IRR with correct tariff and investment costs of 6.47%. This shows that even though the tariff is higher, this is more than counteracted by the higher investment costs. Hence, it was shown quantitatively that the incentive for non-concessional wind power projects in the region has not been reduced even though the tariff has stabilized at a slightly lower level.

In China, the installed capacity of wind power increased from 1 337 MW in 2006 to 3 304 MW in 2007 /26/ and the wind power market was maturing gradually in 2007. NDRC began



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to unify tariff in West Inner Mongolia to be 0.51 RMB/kWh (incl. VAT) on 9 June 2007 /24/ and the subsequent tariffs have been unified and maintained the at the same level /24/. Since the power sector reform in 2002, 35 projects have received a tariff of 0.51 RMB/kWh (incl. VAT) and the tariff was only higher for 4 early specifically approved projects. DNV has verified the approvals and relative documents and was able to confirm that these tariffs were for specific projects and not unified tariff, and could no longer be obtained. DNV was also able to confirm that the 3 approved tariffs were not applicable to the proposed project.

Hence, the wind power tariff of 0.51 RMB/kWh (incl. tax) is reasonable for the proposed project. DNV checked all the data sources, and considered the information regarding the historical tariff notification in West Inner Mongolia as reliable.

Total investment costs

The investment cost used in the financial analysis were compared with the data reported for other similar proposed CDM projects in the region, i.e. other wind power projects in the West Inner Mongolia. The investment costs (9 733 RMB/kW) were found to be in the range of the other projects: 7 736 RMB/kW to 10 393 RMB/kW. The investment costs were further attempted cross checked against real costs. DNV has checked the actual cost for the wind turbine and tower /32/, the turbine and boost voltage base construction, the 35kV collector line and box type transformer construction in the contracts /31/, which are the main part of total investment (more than 90% of the total investment). The total value of the contact above is 5.2% more than the estimated value in Revised FSR /8/.

DNV could confirm that the total investment in Revised FSR is reasonable and conservative.

O&M costs

The annual O&M cost for wind power projects may vary by site location, conditions for transportation, applied technology, number of turbines and regional inflation. As shown above table 2, the annual O&M costs (92 RMB/MWh) were found to be in the range 62 RMB/MWh to 109 RMB/MWh.

Other costs

The other costs of the proposed project applied in the Revised FSR developed by Inner Mongolia Power Exploration & Design Institute in April 2008 /8/ was verified by DNV. By checking further explanation for the investment analysis in the proposed project by the developer of Revised FSR /47/, DNV could determine that the “other costs” main constitutes travel expenses, office expenses, training fee, traffic expenses and union due, etc., while is isolated from the costs of maintenance, insurance, materials fee, salary and welfare in the O & M cost.

Furthermore, it should be noted that even if “other expense” were assumed to be zero, the project IRR without CER revenue would be 6.67%, which is still lower than the benchmark of 8%.

Taxes

According to the current law in China, the VAT is defined as 8.5% for wind power industry /40/. The income tax in the Revised FSR is 25%, the city building tax and education added tax are 5% of VAT and 3% of VAT, which are also in line with Chinese law /40/. There is no tax



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holiday for the proposed project which has been verified by DNV from the tax regulations. Therefore, the tax used in the project's investment analysis is valid.

In the IRR calculation spreadsheet, the tax benefits from interest are included, and that will make the total cash flow higher. DNV could determine it will be more conservative for the result of IRR calculation and thus it is acceptable.

4.4.6 Investment analysis: Calculation and conclusion

The IRR calculations were provided in a spreadsheet. The calculations were verified and found to be correct by DNV. The assumptions used in the calculations were deemed to be correct by DNV. The project IRR without CDM revenues is 6.47%, which confirms that the project in the absence of CDM benefits and compared to the benchmark of 8% is not financially attractive. With CER revenues the project IRR increases to 9.78%, which is above the benchmark of 8%.

4.4.7 Investment analysis: Sensitivity analysis

A sensitivity analysis has been carried out for parameters contributing more than 20% to revenues or costs to check the robustness of the financial analysis /20/. Reasonable variations of the static investment, annual operational costs, and annual output delivered to the grid and on-grid tariff were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.

DNV was able to verify that the project IRR will touch the benchmark only if the above mentioned parameters change by values as mentioned below:

<i>Key Indicators</i>	<i>Variation of the parameter indicator needed to reach benchmark 8%</i>
Static investment costs	-10.91%
Annual O&M cost	-63%
Electricity tariff	12.4%
Annual output delivered to the grid	12.4%

1) Total Static Investment:

DNV was able to confirm that 10.91% decrease in investment costs is unlikely to happen, as a large part of the total investment of the proposed project goes towards purchase and installation of electric equipments (including wind turbines and transformers) according to Revised FSR /8/, and the prices, including equipments and commodities, also the labor costs have been increasing in recent years /22/. As analysis in the section 4.4.5, the investment costs were further attempted cross checked against real costs. DNV has checked the actual cost for the wind turbine and tower /32/, the turbine and boost voltage base construction, the 35kV collector line and box type transformer construction in the contracts /31/, which are the



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main part of total investment (more than 90% of the total investment). The total value of the contract above is 5.2% more than the estimated value in Revised FSR /8/.

Therefore the static total investment is not likely to decrease by more than 10.19%.

2) O&M Cost:

As prices, including those of the required equipment and commodities, have been increasing in recent years /22/, DNV can confirm that it is not feasible and realistic to operate a wind farm even almost without O&M costs assuming that the annual O&M cost decreases by 63%.

3) Power Tariff:

As analysis above, the proposed project is an un-tendering project; for this type of project, the tariff is fixed for a long term according to China's Management Rules on Tariff issued by NDRC /24/. The tariff of similar wind projects was kept at the same value (0.51 RMB/kWh) in West Inner Mongolia during the last years /24/. Hence it is unlikely that the electricity tariff will increase by 12.4%.

4) Annual Power Generation:

Grid-in electricity output is limited by wind resources on the project site. In Revised FSR /8/, the determination of installed capacity and operation hours was discussed sufficiently in relation to the wind resources. Moreover, the annual output is estimated basing on the long term weather statistic data provided by local meteorological station from year 1988 to year 2006 and the annual average wind speed of the project site tends to decrease on the basis of past over 20 years' wind resources and to gradually be stable in recent years /8/. Therefore, it is highly unlikely for the output to increase by 12.4%.

The analysis above shows that very unrealistic favorable circumstances would be needed for the IRR to reach the benchmark. Therefore the project is not financially attractive. This demonstrates that the project activity would not be implemented without the CDM.

4.4.8 Common practice analysis

In China, most policies are promulgated in provincial level by combining the national policy with the region's condition. In addition, abundant and high quality wind resources in Inner Mongolia make this region different from other regions in the aspect of electricity output, eventually in the aspect of economic feasibility. Hence, it is reasonable that Inner Mongolia is selected as scope for common practice analysis.

The analysis is restricted to large scale project (using the CDM definition of large scale: >15 MW) as small scale projects are not comparable in size to the 50 MW installed by the proposed project activity.

The 2002 is the year benchmark as 2002 is a threshold for economic reform in electricity sector.

Following the above three rules there are 2 projects not applying CDM selected out /26/: Dali phase III wind project and the Da Mao Qi Bailingmiao wind project. Dali phase III wind project was a demonstration project supported by national debt fund which is no longer given in Inner Mongolia /27/. The Da Mao Qi Bailingmiao wind project is 100% foreign-owned and is pursuing Gold Standard accreditation for its emission reductions because of the financial unattractiveness /28/.



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DNV has checked all sources mentioned in the PDD and could conclude that the construction of a wind farm project of 50 MW (without CDM support) is not a common practice in Inner Mongolia.

4.5 Monitoring

As checked the PDD /1/, DNV could determine that the monitoring plan complies with the requirements of ACM0002 version 10 “Consolidated monitoring methodology for zero emissions grid-connected electricity generation from renewable sources” /5/ and the monitoring plan could provide real measurements of achieved emission reductions.

4.5.1 Parameters determined ex-ante

The combined margin emission factor is determined *ex-ante* based on the most recent information available; the detailed calculations of the combined margin emission factor are described in the following section 4.6. The parameters are listed in below table:

<i>Data and Parameters</i>	<i>Unit</i>	<i>Ex-ante Determined Value</i>
Operating margin of NCPG (OM)	tCO ₂ /MWh	1.0069
Build Margin of NCPG (BM)	tCO ₂ /MWh	0.7802
Emission factor of NCPG	tCO ₂ /MWh	0.9502

4.5.2 Parameters monitored ex-post

The parameter monitored *ex-post* is the net electricity generation from the proposed project activity. The net electricity generated from the project will be measured through the metering equipment at the substation, with accuracy not lower than 0.5. It will be continuously measured and recorded monthly. This data will be cross verified against the sales receipt from the grid. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup. CGN Wind Power Co., Ltd will be responsible for the overall monitoring and reporting and will keep all the data and material /1//35/.

- The net electricity supplied to the grid will be monitored by the main meter, which is installed in the substation. This main meter has two-way metering function, recording both exports and imports from the grid; net electricity supplied to the grid is calculated as exports minus imports /1//35/.
- The backup meter will be installed at the substation as an auxiliary one. When the main meter has a breakdown, the readings of the backup meter will be adopted /1//35/.
- Appropriate additional meters will be installed at the project site if the proposed project has to share the same transformer, substation or transmission line with some other wind farms. So that the electricity generation can be monitored for each wind farm separately so as to calculate the share of this wind farm of the net supply to the grid /1/.
- The main meter in the project site will be calibrated once a year by a qualified organization in compliance with the national standard and sectional regulations and sealed after the calibration. The separate meters in other project sites (if any) will be calibrated according to the national regulation by qualified third party. The accuracy of all meters is no less than 0.5 /1//35/.



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The monitoring plan is in accordance with the monitoring methodology, and it will give opportunity for real measurements of achieved emission reductions.

4.5.3 Management system and quality assurance

The project's monitoring plan includes:

1. Monitoring and responsibility
2. The monitored data
3. Installation of meters
4. Data monitoring
5. Quality control
6. Data management
7. Reporting and Verification

Detailed procedures have been elaborated and attached at B.7.2 of the PDD. These will be maintained and implemented to enable subsequent verification of emission reductions.

4.6 Estimate of GHG Emissions

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

- 1) Baseline emissions: baseline emissions (BE_y in tCO_2) are the product of the grid emission factor ($EF_{grid,CM,y}$ in tCO_2/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh).
- 2) Project emissions: There are no emissions from the project which is a renewable energy project.
- 3) Leakage: No leakage has to be considered for the proposed project activity.

According to the feasibility study of the proposed project, the net electricity generated is approximately 125 573 MWh, i.e. $EG_y = 125\,573$ MWh;

And $EF_y = 0.9502$ (tCO_2e/MWh) as illustrated below. Therefore, the estimated emission reduction of the first crediting period is as follows:

$$ER_y = BE_y = EG_y * EF_y = 119\,319 \text{ tCO}_2\text{e per year}$$

The grid emission factor is determined *ex-ante* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM).

The PDD version 3 was provided on 03 June 2010, and the calculation of the grid emission factor has been updated to the latest data which was the most available at the commencement of validation. The data used in the EF calculation is in accordance with data in the China Electric Power Yearbook from 2004 to 2008 (published annually) /14/ and the China Energy Statistical Yearbook from 2006 to 2008 /15/.

The assessment of the grid emission factor of NCPG is as follows:

The grid emission factor of the North China Power Grid (NCPG) is determined *ex-ante* for the 7 years crediting period following the tool to calculate the emission factor for an electric system, version 02 dated 16 October 2009 /7/, based on the most recent information available. It has been calculated as 75%:25% as the weights of the operating margin and the build margin.

Operating Margin: Simple OM was chosen and this is justified since the low cost /must run resources constitute less than 50% of total grid generation the method a) simple OM can be



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selected in NCPG, from 2004 to 2008, low cost /must run resources constitute (0.86% in 2003, 0.76% in 2004, 0.75% in 2005, 0.79% in 2006 and 0.86% in 2007) of total grid generation /14/.

Aggregated generation and fuel consumption data are used due to the fact that more disaggregated data are not available in the NCPG, the total electricity delivered to the NCPG has been used which are obtained from the China Electric Power Yearbook from 2004 to 2008 (published annually) /14/. Country specific data for net calorific value of each type of fossil fuel are obtained from the China Energy Statistical Yearbook from 2006 to 2008 /15/ and the IPCC 2006 default values /12/ for the oxidation factor and the emission factors of each type of fossil fuel are deemed reasonable.

The OM is calculated to be 1.0069 tCO₂/MWh /38/. The sources and calculation has been verified by DNV.

Build Margin: Build margin was determined *ex-ante*. Because plant specific fuel consumption and electricity generation data are not publicly available in China, the guidance requested by DNV from the CDM Executive Board for a deviation of the baseline methodology of AM0005 has been applied for calculation of the build margin (BM) emission factor for this project /13/.

- Use of capacity additions from the years 2005 to 2007 is chosen and reaches 21.75% of the total installed capacity /14/.
- Use of weights estimated using installed capacity in place of annual electricity generation. Thermal power plant accounts for 95.25% of the total installed capacity additions in this period. Since specific data for each technology is not available, the fraction of fuels (coal 98.63%; natural gas 1.30%; oil 0.07%) was estimated from the CO₂ intensity for the fuels used in NCPG /15/.
- Efficiencies of 38.10% for coal power plants and 49.99% for oil or gas power plants are defined as the best technology commercially available in China by the DNA of China /17/.

Country specific net calorific value of each kind of fuel from the China Energy Statistics Yearbook in 2007 /15/, and IPCC 2006 default values /12/ for emission factors of each kind of fuel and carbon oxidization factor are used to calculate the BM in the NCPG. The official supporting documentation has been verified.

The BM is calculated as 0.7802 tCO₂e/MWh which was verified from the spreadsheet for BM calculation /38/.

The resulting combined margin emission factor 0.9502 tCO₂e/MWh is fixed *ex-ante* for the first crediting period. The annual electricity delivered to the NCPG is expected to be 125 573 MWh. The expected annual baseline emissions of the project is 119 319 tCO₂e per year.

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

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



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4.7 Environmental Impacts

An Environmental Impact Assessment (EIA) has been conducted according to Chinese law & regulation /10/. The potential environmental impacts have been sufficiently identified. No significant environmental impacts are expected from the project activity. The Environment Protection Bureau of Inner Mongolia Autonomous Region approved the project activity on March 2008 /11/.

4.8 Comments by Local Stakeholders

Besides the stakeholder consultation process stipulated in the Chinese EIA regulation, project developer have conducted an additional stakeholder consultations /10/. Local stakeholders from local residents and local government were invited through a symposium and questionnaire to provide comments on the project. In the survey, 50 questionnaires were distributed to local stakeholders and 50 questionnaires were returned giving a 100% response rate /33/. As the statement by the project participant on the interview meeting, the nearest village surrounding the project region is over 2 km and the local residents are rare. Then DNV could confirm that 50 questionnaires are enough for stakeholders' investigation /48/.

As checked all the questionnaires received /33/ and the interview with the project owner, DNV could determine that the proposed project received full support from the local stakeholders.

DNV considers the local stakeholder consultation carried out adequately.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD (version 1.1) of 28 July 2009 was made publicly available on UNFCCC's website (<http://cdm.unfccc.int/Projects/Validation/DB/2LSXFXJ4HUUI2YIBFNBQWCA0W8J2BY/view.html>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 18 August to 17 September 2009.

No comments were received 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
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR-1 OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	CAR-1 OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	CAR-1 OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto	CDM Modalities and Procedures §31b	CAR-1 OK



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Requirement	Reference	Conclusion
Protocol Article 5 and 7.		
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About small-scale project activities (if applicable)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK
15. If required by the host country, an analysis of the environmental impacts of the	Simplified Modalities and Procedures for	OK



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Requirement	Reference	Conclusion
project activity is carried out and documented.	Small Scale CDM Project Activities §22c	
About stakeholder involvement		
16. 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
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. 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
20. 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
21. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. 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



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Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/ /8/	DR I	Yes. CGN Inner Mongolia Zhurihe Phase II Wind Farm Project is located in Zhurihe Town, Xilinguole League, Inner Mongolia Autonomous Region of People's Republic of China. The geographical coordinates of the wind farm is at the attitude 42° 27'11" (N) and latitude 112° 48'03" (E).		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/ /8/ /17/	DR	Yes. The projects system boundaries are clearly defined. The power generated will be exported to the North China Power Grid (NCPG), which is defined as project system boundary.		OK
A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2.1. Which Parties and project participants are participating in the project?	/1/ /2/ /3/	DR I	China and the UK are the two Parties participating in the proposed project activity. China is hosting the project and the UK is the Annex I Party. CGN Wind Power Co., Ltd is the project participant from the Host Party (P. R. China).		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /2/ /3/	DR I	LoA from the DNA of China has been issued in June 2009. But the LoA by the DNA of the UK is still pending.	CAR-1	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /2/ /3/	DR I	China ratified the Kyoto Protocol on 30 August 2002. DNA of China is National Development and Reform Commission. UK ratified the Kyoto Protocol on 31 May 2002. DNA of the UK is Global Carbon Markets Department of Energy and Climate Change. The LoA by the DNA of the UK is still pending.	CAR-1	OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/ /2/ /3/	DR I	DNV will determine if the project can be seen as a diversion of official development assistance (ODA) funding until the LoA from the DNA of the Annex I party is provided.	CAR-1	OK
A.3. Technology to be employed					

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<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/ /32/	DR I	Yes. DNV can identify the project design engineering reflects current good practices in China through the turbine purchase contract /32/. The main equipment wind turbines with mature technology are from the Beijing North Heavy Turbine Co., Ltd, and the install capacity is 50MW, the operating time is 2 512hrs/year, and the designed operational lifetime is 20 years.		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/ /32/	DR I	The project relates to install domestically-made 25 sets of turbines with unit capacity of 2 000 kW, amounting to a total generation capacity of 50 MW. Through the turbine purchase contract /32/, DNV can verify that the technologies employed in the project activity are advanced domestic technologies, and there is no technology transfer activity involved.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR I	The wind farm operating training plan and manual have not been provided, and the relevant information needs to be identified in	CL	OK

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			the PDD.		
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /2/	DR I	Yes. The LoA from the DNA of China confirming the project being in line with the sustainable development policies of host country has been issued in June 2009.		OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /8/	DR I	Yes. As a renewable energy project, the project can create other benefits as follows: <ul style="list-style-type: none"> ● Reducing the emission of other pollutants resulting from local coal-based power plants compared to a business-as-usual scenario; ● Creating local employment opportunities during the proposed project construction and operation period; ● Promoting the local tourism industry and improving the livelihoods of local people; ● Help promote localization of manufacture of wind power generator and its parts, therefore speedup the development of wind power generation in China. At a larger scale, the project 		OK

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			will assist China in stimulating and accelerating the commercialization of grid-connected renewable energy technologies and markets in China.		
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /5/	DR	Yes, the project applies the methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generations from renewable sources” version 10 approved by the EB.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /8/ /17/	DR I	Yes. The project is a capacity addition from a renewable energy source and does not involve on-site fuel switch from fossil fuels to a renewable source. The geographic and system boundaries for the relevant electricity grid (NCPG) can be clearly identified.		OK
B.2. Baseline Scenario Determination					

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<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/ /5/	DR	The baseline is determined as continued operation of the existing fossil fuel based power plants connected to NCPG and the addition of new generation sources to meet electricity demand.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /8/ /16/ /18/ /19/	DR I	Three alternative baseline scenarios to the project have been identified and discussed: a) The proposed project activity undertaken without being registered as a CDM project activity. b) Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver comparable generating capacity or electricity generation. c) Continuation of the current situation: operation of grid-connected power plants and addition of new generation sources in the NCPG. Alternative a has less financial attractiveness which IRR is 6.47% lower than the benchmark 8%;		OK

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			<p>Alternative b with installed thermal power capacity of less than 25 MW (equivalent with the proposed 50 MW wind project), does not comply with the Chinese law. This law strictly prohibits the installation of thermal power plants with a capacity below 135 MW in areas covered by large grids such as provincial grids /16/. DNV was also able to confirm that the proposed project is located in the region which has no other exploitable sources of renewable energy such as hydropower energy /19/. Also due to the technology development status and the high cost for power generation, solar PV, geothermal and biomass with the same annual electricity output as the proposed project are alternatives far from being attractive investment in the region /18/. Hence, alternative b) is not a credible alternative for the project developer and has been eliminated from further discussion</p> <p>Alternative c) "Equivalent electricity service provided by the NCPG" is a realistic alternative consistent with current laws and regulations.</p>		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes.		OK

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	/8/				
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /8/ /16/	DR	Yes. According to the deduction from the available information, DNV can confirm the assumptions are conservative.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /8/ /16/	DR I	Yes. The renewable energy law, sectoral policy and development trends in NCPG have been taken into account.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /8/ /16/ /18/ /19/	DR	Yes.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/ /8/	DR	Yes. There are no significant risks to the baseline except the enforcement of the Chinese renewable law. However, this law does not need to be taken into account as it is being implemented only now i.e. after the entry into force of decision 17.CP 7.		OK
B.3. Additionality Determination					

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<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/ /6/	DR	Yes. The additionality of the CGN Inner Mongolia Zhurihe Phase II Wind Farm Project, as required by ACM0002, is demonstrated by applying the “ <i>Tool for demonstration and assessment of additionality</i> ”, version 05.2 /6/. More details refer to B.3.3.		OK
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/ /8/	DR	Yes. All assumptions are stated in a transparent and conservative manner.		OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /6/ /8/ /21/ /32/ /37/	DR I	The “ <i>Tool for the demonstration and assessment of additionality</i> ” version 5.2 is applied /6/. Identification of the alternatives to the project activity consistent with the current laws and regulations. Referring to the B.2.2, Three alternative baseline scenarios to the project have been identified and discussed. Only alternative c) “ Continuation of the current situation: operation of grid-connected power plants and addition of new generation		OK

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			<p>sources in the NCPG.” is a realistic alternative consistent with current laws and regulations.</p> <p>Investment analysis: Choice of approach As the proposed project generates financial and economic benefits other than CDM related income through the sales of electricity and the alternative to the project does not involve an investment, a benchmark analysis (option III) was selected for conducting the investment analysis.</p> <p>Investment analysis: Benchmark selection According to the “<i>Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects</i>” /21/, in China an IRR of 8% (after tax) for the total investment of a project is regarded as a benchmark for investing in large scale hydropower plants, fossil fuel fired plants as well as wind farm projects. The benchmark of 8% (after tax) is therefore appropriate for this project. DNV was able to confirm this is suitable and reasonable as following:</p> <p>1.This benchmark was determined by the national administration of this industry in</p>		

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			<p>China /8//21/;</p> <p>2.This benchmark is for project and after tax and the investment analysis for this project will be for project and after tax also;</p> <p>3. The <i>Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects /21/</i> which is still valid is referred to the risk premiums of large scale wind farm power project, and this file is still valid now.</p> <p>Investment analysis: Input parameters The project IRR of the proposed project activity is 6.47% (after tax) without CDM revenues, which is lower than the benchmark of 8% (after tax). This shows that the project is not financially attractive for investors. According to the “<i>Guidance of EB38 paragraph 54(c)</i>”, DNV has validated the input parameters used in the investment analysis as follows:</p> <p><i>Step 1: Assess the sources of the input parameters</i></p> <p>The input parameters used in the financial analysis of this project activity are all taken</p>		

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			<p>from the Revised FSR developed by Inner Mongolia Power Exploration & Design Institute in 02 March 2009 /8/.</p> <p>These evidences have been provided to DNV during the validation phase.</p> <p><i>Step 2: Confirm that the values used in the PDD are fully consistent with the Revised FSR</i></p> <p>DNV compared the input parameters used in the financial analysis and included in the PDD with the parameters stated in the Revised FSR and was able to confirm that all the values applied are consistent with the Revised FSR /8/, and was able to verify the correctness of this value.</p> <p><i>Step 3: Assess the period of time between the finalization of the Revised FSR and the investment decision</i></p> <p>The Revised FSR was completed on 02 March 2009 /8/ and the project start date was on 15 March 2009 /31/. Given this short period of time between approval of the Revised FSR and the decision to proceed with the project activity, it is unlikely in the context of the</p>		

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			<p>project that the input values would have materially changed. It is thus reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project.</p> <p><i>Step 4: Cross-check the parameters used in the financial analysis with the parameters used by other similar projects</i></p> <p>For the input parameters in the investment analysis, clarification should be sought that:</p> <ol style="list-style-type: none"> 1. The tariff trend from 2002 to 2007 in the project region and the justification on the basis for the tariff assumption in Revised FSR; 2. The constitute for the “other cost” and the explanation for its reasonability; 3. Justification for the ratio of value added tax, city building tax, education added tax and the income tax for this project; 4. The real cost in the first significant financial commitment, which is the turbine purchase for this project. <p>Investment analysis: Calculation and conclusion</p>	CL-2	

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			<p>The IRR calculations were provided in a spreadsheet /37/.</p> <p>Sensitivity analysis The additionality tool requires considering a realistic range of assumptions for the input parameters of the financial analysis and +/- 10% does not always reflect a realistic range. DNV has verified each input parameter's value at which the IRR will be equal to the benchmark and assessed the likelihood of attaining the arrived values against each parameter and confirm that it is not likely that the IRR will become equal to the benchmark.</p> <p>1) Total Static Investment:</p> <p>DNV was able to confirm that 10.91% decrease in investment costs is unlikely to happen, as a large part of the total investment of the proposed project goes towards purchase and installation of electric equipments (including wind turbines and transformers) according to Revised FSR /8/, and the prices, including equipments and commodities, also the labor costs have been increasing in recent years /22/. Therefore the</p>		

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			<p>static total investment is not likely to decrease by more than 10.91%.</p> <p>2) O&M Cost:</p> <p>The project participant need to provide reference to clarify that it is unlikely for the O&M cost to drop by 63%.</p> <p>3) Power Tariff:</p> <p>Clarification should be sought for the tariff trend from 2002 to 2007 in this region and the justification on the basis for the tariff assumption in Revised FSR;</p> <p>4) Annual Power Generation:</p> <p>Grid-in electricity output is limited by wind resources on the project site. In Revised FSR /8/, the determination of installed capacity and operation hours was discussed sufficiently in relation to the wind resources. Moreover, the annual output is estimated basing on the long term weather statistic data provided by local meteorological station from year 1988 to year 2006 and the annual average wind speed of the project site tends to decrease on the basis of past over 20 years' wind resources and to gradually be stable in recent years /8/. So, it is highly unlikely for</p>	<p>CL-3</p> <p>CL-2</p>	

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			<p>the output to increase by 12.4%.</p> <p>Barrier analysis: Not applicable.</p> <p>Common practice analysis: In China, most policies are promulgated in provincial level by combining the national policy with the region's condition. In addition, abundant and high quality wind resources in Inner Mongolia make this region different from other regions in the aspect of electricity output, eventually in the aspect of economic feasibility. Hence, it is reasonable that Inner Mongolia is selected as scope for common practice analysis. It is reasonable to define as the capacity range over 15MW. The 2002 is the year benchmark as 2002 is a threshold for economic reform in electricity sector. Following the above three rules there are 2 projects not applying CDM selected out: Dali phase III wind project and the Da Mao Qi Bailingmiao wind project. Dali phase III wind project was a demonstration project supported by national debt fund which is no longer given in Inner Mongolia. The Da Mao</p>		

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>Qi Bailingmiao wind project is 100% foreign-owned and is pursuing Gold Standard accreditation for its emission reductions because of the financial unattractiveness. DNV has checked all sources mentioned in the PDD and could conclude that the construction of a wind farm project of 50 MW is not a common practice in Inner Mongolia.</p>		
<p>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?</p>	<p>/1/ /8/ /32/</p>	<p>DR I</p>	<p>DNV could confirm that the first significant financial commitment of this project is the turbine contract dated on 15 March 2009, which is determined as the project starting date.</p> <p>According to the EB 48 Annex 61, The project participant needs to provide the notifications in writing of the commencement of the project activity and of their intention to seek CDM status both to the DNA of China and UNFCCC secretariat.</p>	CL4	OK
<p>B.4. Calculation of GHG Emission Reductions – Project emissions</p> <p><i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i></p>					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/	DR	Yes. Project emission is regarded as zero as the project is a renewable energy (wind source) project.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	N/A		
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	N/A		
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /38/ /39/	DR	Baseline emissions have been calculated by multiplying the net electricity supplied to the grid and the NCPG emission factor. The grid emission has been calculated as the weighted average of operating margin (OM) and build margin (BM), and the calculation spreadsheet has been provided /38//39/.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/ /12/	DR	Yes.		OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	No significant uncertainties can be addressed for the project.		OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/	DR	According to ACM0002 /5/, potential leakage effects, such as emissions arising from power plant construction and land inundation do not have to be considered.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	N/A		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	N/A		OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation</i>					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>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/ /5/	DR	Yes. The EF calculation spreadsheet has been provided /38//39/.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/	DR	Yes. The monitoring plan follows to the approved monitoring methodology ACM0002 (version 10) “consolidated monitoring methodology for zero emissions grid- connected electricity generation from renewable sources” and in a complete and transparent manner.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/ /5/	DR	Yes.		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the	/1/ /5/	DR I	There are no emissions from the project activity.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
greenhouse gas emissions within the project boundary during the crediting period?					
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	The project uses the ex-ante determination approach to calculate the OM and BM. Only the net electricity generated and sold to the grid will be monitored ex-post.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/ /5/	DR	Yes. The choice of baseline indicators is in line with ACM0002 (version 10).		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Yes. The electricity generated delivered to the grid will be monitored directly.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR I	The main meter with accuracy no less than 0.5s will be installed at the project site, connecting to the NCPG via the step-up substation. The monitoring parameters are $EG_{\text{export},y}$ and $EG_{\text{import},y}$, and a backup meter is also installed in the substation. Clarification is sought to the monitoring frequency of metering equipment.	CL-5	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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 main meter's accuracy no less than 0.5s. The procedures to deal with erroneous measurements have been in place.		OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR I	Clarification is sought to the monitoring frequency.	CL-5	OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/	DR	Yes. The procedure for records handling are identified in the monitoring plan.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	The maintenance of monitoring equipment and installation are according to the national industrial standard. The calibration interval is once a year.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Yes. Records handling has been identified in part B.7.2 of PDD.		OK
B.11. Monitoring of Leakage <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/ /5/	DR	According to ACM0002 version10, potential leakage effects, such as emissions arising from power plant construction and land		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			inundation do not have to be considered.		
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	N/A		
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	N/A		
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /5/	DR I	Neither ACM0002 nor the Chinese DNA requires collection and archiving of relevant data concerning environmental, social and economic impacts. However the environmental impacts will be monitored by local environmental authority.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Yes. 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.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	N/A		
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	Yes. The authority and responsibility of project management is described in the PDD.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes. The description of training plan has been included in the monitoring plan.		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No emergency situation which can cause unintended emissions is expected from the project.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	Yes. The procedures for review of reported results/data has been identified in the monitoring plan.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/ /5/	DR	Yes. The procedures for corrective actions in order to provide for more accurate future monitoring and reporting are identified.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/ /32/	DR	DNV could confirm that the first significant financial commitment of this project is the turbine contract dated on 15 March 2009, and so that the project starting date was determined as 15 March 2009. The project operational time is clearly defined as 20 years and consistent with Revised FSR.		OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR I	Yes. The date of crediting period is started on 1 July 2010 or the registration date of the project activity whichever is later.		OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /10/	DR I	Yes. The impacts during construction duration and after commissioning are properly described, including the impacts on noise, waste water and sewage, dust and air quality, also ecological environment.		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if	/1/ /10/	DR I	Yes. The EIA has been approved by Environment Protection Bureau of Inner		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
yes, is an EIA approved?	/11/		Mongolia Autonomous Region on March 2008 /11/.		
D.1.3. Will the project create any adverse environmental effects?	/1/ /10/	DR I	There are no significant adverse environmental effects for the project according to the EIA /10/.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /10/	DR I	There are no trans-boundary environmental impacts foreseen for the project.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /10/	DR I	Yes.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/ /10/	DR I	Yes		OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	/1/ /33/	DR I	Yes. A consultation meeting was carried out in March 2009 for collecting the local stakeholders' views and opinion as per the implementation of the proposed project activity, as well as a survey was made among the potential stakeholders by distributing 50 questionnaires and got a 100% response rate /33/.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /33/	DR I	Yes. The site surveys, distribution of questionnaires and meetings have been used to invite comments by local stakeholders.		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/ /10/	DR I	Yes. The stakeholder consultation process is in accordance with the Chinese EIA regulation /10/.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/ /33/	DR I	Yes. 50 one-page questionnaires were distributed and 50 questionnaires were collected. The summary of the stakeholder comments received is described in the PDD.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/ /33/	DR I	No negative comments were received.		OK

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Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

Checklist question	Ref	MoV	Comments	Draft Concl.	Final Concl.
A. Letter of approval					
A.1. Is the LoA received directly from the DNA or through the project participant?	/2/ /3/	DR	The LoA from the DNA of China has been issued in June 2009. The LoA from the DNA of the UK is still pending.	CAR+	OK
B. Project design					
B.1. Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/ /8/	DR	It is by a transparent and accurate way to describe the project activity such as project site, the capacity, the turbines and parameters and those are consistent with related information reflected in Revised FSR /8/.		OK
B.2. Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/1/ /8/	DR I	DNV can determine that the project activity is a newly built wind farm project constructed before the start of the validation.		OK
B.3. Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/1/-/39/	DR I	The project activity is a large scale project fully addressed in the Revised FSR /8/ and PDD /1/; On 17 September 2009, Huang Peng (Peter) and Li Lei (Kevin) from DNV Climate Change Service performed the interview with		OK

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			project stakeholders to confirm selected information and to resolve issues identified in the document review. DNV did not perform site visit for CGN Inner Mongolia Zhurihe Phase II Wind Farm Project since the proposed project was just under construction and installing, also there's no immigration involved /10/. The PDD, Revised FSR, EIA and additional background documents related to the project design and baseline were effectively assessed as a part of the validation /1/-/39/ to address the current status of the proposed project.		
B.4. Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/ /8/	DR I	No, the project activity is a newly built wind farm.		OK
C. Project emissions not addressed by the methodology					
C.1. Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/1/	DR	Yes. Project emission is regarded as zero as the project is a renewable energy (wind source) project and there are no leakages that need to be considered in applying this methodology.		OK
D. Documentation of baseline emissions					

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D.1. Documentation of the baseline determination: <ul style="list-style-type: none"> • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity 	/1/	DR	<ul style="list-style-type: none"> • All assumptions and data such as OM and BM determined ex_ ante used by the project participants are listed in the PDD and EF calculation spreadsheet, and all are properly referenced. • Yes; • Yes; • Yes; • Yes; • Yes; <p>The applicability of this methodology is justified since:</p> <p>It is a grid connected zero emission renewable electricity capacity additions from wind energy.</p> <p>DNV can confirm that it does not involve switching from fossil fuel to renewable energy at the project site.</p> <p>The project is connected to NCPG which geographical and system boundaries are clearly identified and information on the characteristics of this grid is available.</p>		OK
E. Documentation of the calculations					
E.1. Algorithms and/or formulae used to determine emission reductions E.2. All assumptions and data used by the project	/1/ /38/ /39/	DR	The calculation spreadsheet of the grid emission factor has been provided by the project participant, DNV could confirm that		OK



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<p>participants are listed in the PDD and related document submitted for registration. The data are properly referenced</p> <p>E.3. All documentation is correctly quoted and interpreted.</p> <p>E.4. All values used can be deemed reasonable in the context of the project activity</p> <p>E.5. The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.</p>			<p>the algorithms and the formulae were all properly used to determine emission reductions.</p> <p>Yes.</p> <p>Yes.</p> <p>Yes.</p> <p>Yes.</p>		
F. Implementation of the monitoring plan					
<p>F.1. How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project be monitored ex-post and verified later by a DOE?</p>	/1/	DR	Plans for implementation of the monitoring plan, data management, QA/QC procedures in PDD are assessed against the Management and Operation Manual for CGN Inner Mongolia Zhurihe Phase II Wind Farm Project.		OK
G. CDM consideration prior to starting date					



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<p>G.1.The prior consideration of CDM for the project activity complies with EB41 annex 46</p>	<p>/1/ /31/ /32/</p>	<p>DR</p>	<p>On 15 March 2009, the turbine contract was signed /32/, which is the first financial commitment for this project. And so that 15 March 2009 was substantiated as the starting date of the project activity.</p> <p>As per EB 41 Annex 46 and the EB 48 annex 61, the project participant also needs to provide the notifications in writing of the commencement of the project activity and of their intention to seek CDM status to the UNFCCC secretariat.</p>	<p>CL-4</p>	<p>OK</p>
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Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 The LoA by the DNA of the UK is still pending.	A.2.2 A.2.3 A.2.4 Table 2b A.1	The LoA by the United Kingdom of Great Britain and Northern Ireland was obtained on 15 October. The softcopy has been provided to DOE.	OK. The LoA from the DNA of United Kingdom has been provided by the project participant. CAR 1 is closed.
CL 1 The wind farm operating training plan and manual have not been provided, and the relevant information needs to be identified in the PDD.	A.3.3	The operating training plan and manual has been provided to DOE. And the relevant information was identified in the Revised PDD.	OK. The operating training plan and manual has been provided by the project participant. CL 1 is closed.
CL 2 For the input parameters in the investment analysis, clarification should be sought that: 1. The tariff trend from 2002 to 2007 in the project region and the justification on the basis for the tariff assumption in the Revised FSR; 2. The constitute for the “other cost” and the explanation for its reasonability; 3. Justification for the ratio of value added tax, city building tax, education added tax and	B.3.3	1. Based on the available tariff documents since 2002, the first unified tariff for the conventional wind farm project in West Inner Mongolia is 0.51 RMB/kWh in light of the document issued by Chinese government on 9 June 2007(Fa Gai Jia Ge [2007] No.1260). And the tariff stays 0.51 RMB/kWh in the subsequent tariff documents from 2007 until recent, which are issued in December 2007 (Fa Gai Jia Ge [2007] No. 3303), July 2008	OK. 1. DNV checked all the data sources, and considered the information regarding the historical tariff notification in West Inner Mongolia as reliable. The wind power tariff of 0.51 RMB/kWh (incl. tax) is reasonable for the proposed project. 2. By checking further explanation for the investment analysis in the proposed project by the developer of the Revised FSR /47/, DNV could determine that the



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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 income tax for this project;</p> <p>4. The real cost in the first significant financial commitment, which is the turbine purchase for this project.</p>		<p>(Fa Gai Jia Ge [2008] No. 1876), and July 2009(Fa Gai Jia Ge [2009] No. 1906), respectively.</p> <p>The Revised FSR was completed in 02 March 2009 with the referred tariff of 0.51 RMB/kWh. The PDD of the proposed project was completed in July 2009 with the referred tariff of 0.51 RMB/kWh derived from the Revised FSR. As the documents mentioned above, the tariff in West Inner Mongolia is 0.51 RMB/kWh from 2002 to 2009. Thus the tariff in the Revised FSR and PDD were the most valid and available data at the time.</p> <p>Therefore, the tariff in the West Inner Mongolia is stable at 0.51 RMB/kWh without significant changes since 2007, and also the available and valid tariff till the PDD webhosting (28 July 2009).</p> <p>2. The detailed component of the other fee comprises of business travel, office expenses, training fees, daily transport</p>	<p>“other costs” main constitutes travel expenses, office expenses, training fee, traffic expenses and union due, etc. The assumed value is reasonable and conservative.</p> <p>3. The references about the value added tax, city building tax, education added tax and the income tax for this project has all been provided by the project participant.</p> <p>4. As checking the turbine purchase agreement and the Revised FSR, the real cost in the first significant financial commitment is 1.07% higher than the value assumed in the Revised FSR, and hence the total investment assumed was conservative.</p> <p>CL 2 is closed.</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>costs and union fees for the proposed project. The value of the 'other fee' of the proposed project is 18 RMB/kw, which is within the reasonable range of the similar projects in the same region.</p> <p>3. The taxes in the investment analysis of the project include the income tax, value added tax, education added tax and city building tax.</p> <p>The references of the taxes are as below:</p> <p>i. Income tax of 25% is in accordance with the <i>People's Republic of China Enterprise Income Tax Provisional Regulations</i> issued in March 2007. http://202.108.90.130/n480462/n503829/n513111/n513397/7428564.html</p> <p>ii. VAT of 8.5% for wind power industry is half that of normal VAT of 17%, is in accordance with <i>VAT policy</i></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><i>on Comprehensive Utilization of Resource and Other Products</i> (CaiShui[2008](156)) released by Ministry of Finance and State Administration of Taxation on 09/12/2008. http://202.108.90.130/n8136506/n8136593/n8137537/n8138502/8714515.html</p> <p>iii. City build tax of 5% for the projects located in the county or town. http://202.108.90.130/n480462/n480513/n480979/n554229/999267.html</p> <p>http://202.108.90.130/n480462/n480513/n480979/n554229/1007841.html</p> <p>iv. Education added tax of 3% for the projects located in the county or town. http://www.gov.cn/jrzg/2005-09/24/content_69824.htm</p> <p>The values of the taxes in the Revised FSR, PDD and IRR calculation forms</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>are accordance with the public documents mentioned above.</p> <p>4. Until now, the Equipment Purchase Agreement (for the turbine and generator) and the Tower Purchase Agreement Contract have been signed already. And the real expense of the two parts is higher than the estimation in the Revised FSR. The contracts have been provided to DOE for the cross check.</p>	
<p>CL 3</p> <p>The project participant need to provide reference to clarify that it is unlikely for the O&M cost to drop by 63%.</p>	B.3.3	<p>The O & M costs mainly include the repair cost, salary & social welfare, materials fee, other fee and the insurance fee. Based on the data published by the Inner Mongolia Autonomous Region Bureau of Statistic, there is an increasing tendency of the salary and materials purchasing prices. Therefore, it is unlikely for the O&M costs to drop by 63% to reach the benchmark rate of 8%.</p> <p>http://www.nmgtj.gov.cn/Html/jjshfztjg</p>	<p>OK. The reference clarifying that it is unlikely for the O&M cost to drop by 63% has been added in the PDD page 13.</p> <p>CL 3 is closed.</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
		b/2009-7/0/2385.shtml	
CL 4 According to the EB 48 Annex 61, The project participant needs to provide the notifications in writing of the commencement of the project activity and of their intention to seek CDM status both to the DNA of China and UNFCCC secretariat.	B.3.4 Table 2b G.1	Both of the two notifications have been provided to DOE.	OK. The project owner informed Chinese DNA and the UNFCCC secretariat of the project commencement and their intention to seek CDM status respectively on 11 May 2009 and 05 September 2009 /30/. Softcopies of both two notifications have been checked. CL 4 is closed.
CL 5 Clarification is sought to the monitoring frequency of metering equipment.	B.10.5 B.10.6	Detailed information has been presented in the Revised PDD.	OK. The project participant has clarified the monitoring frequency in B.7.2 of PDD version 4.0. The monitoring method will be Continuous measurement and at least monthly recording. CL 5 is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Peng Huang

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJi-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power	Jan 2009	Jan 2009			
Renewables	Mar 2009	Jan 2009			
Other renewable		Sept 2009			
Biomass					
Grid connection of isolated system		Sept 2009			
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 1 September 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Lei (Kevin) Li

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJi-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power					
Renewables					
Wind power					
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 28 August 2008

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

zhi Ang (Walter) Tang

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJi-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power	Jan 2009				
Renewables	Jan 2009			Apr 2009	Apr 2009
Wind power					
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery		Sept 2009			
Efficiency of thermal power plants	July 2009	July 2009			
Coal mine methane					
Fuel switch		Sept 2009			
Manure management					
Waste / wastewater treatment					
Energy efficiency		Sept 2009			
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery		Sept 2009			
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 1 September 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Zhu Chao

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJi-i1)

GHG Auditor:						
Technical Area		CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas						
	Hydro power					
Renewables	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane				Jan 2009		
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency						
N ₂ O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO ₂ recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF ₆						

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services